

**This
Saturday
August 19!**



EAA Chapter 691 Newsletter
August 2023

David Roe's RV-8

On the Web @ 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

Table Of Contents:

- Upcoming Events **pp. 3**
- Letter from the Editor **pp. 5**
- President's Report **pp. 6**
- Member Happenings **pp. 7**
- Tech Corner **pp. 13**
- Ford Trimotor Specs **pp.15**
- EAA Chapter Renewal **pp. 17**



Upcoming Events

Upcoming Events

→ Meetings Schedule (unless otherwise noted) ←

9:30am - social time

10:00am - business meeting

10:30am -
speaker/workshop/training

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

September – **EAA Chapter 691 hosts the Ford Trimotor**, September 14-17, 2023, (SAF) Coordinator- Will Fox/Marc Bonem

September - **Espanola Young Eagles/Cookout**, September 23, 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.

**TOMORROW
August 19th
LAM**



**David Roe gives a talk on his Electronic Control
Ignition and Fuel Injection System**



1929 FORD TRIMOTOR Rides



**September
14th-17th**

Location: Santa Fe Airport, Jet Center

September 14th - 3:00 pm to 5:00 pm
15th - 9:00 am to 5:00 pm
16th - 9:00 am to 5:00 pm
17th - 9:00 am to 5:00 pm

Viewing: Free
Rides: Adult/\$95, Children (17 and under) \$65

Hosted by
**Experimental Aircraft Association
Green Chile Chapter 691**

For questions or additional information: go to eaachapter691.org or email Marc at mbonem7@gmail.com. All are welcome.

Letter from the editor(s)

by April Fox



President's Report

by Will Fox



A Moment In History

Hi Folks, We have a great presentation coming up this Saturday in Los Alamos at the airport terminal building. David Roe will do a show and tell on the electronic fuel injection and ignition system he has installed on his RV-8. I had a chance to fly David's plane recently and the performance is pretty amazing. Basically the engine starts and idles like a car whether the engine is hot or cold. No more frustrating hot starts. It really shines in cruise. We were cruising at 165 knots and burning about 6.9 gallons/hr at 2300 rpm at 10,500' MSL. That is about 28 miles/gallon at 190 mph. That is pretty amazing fuel economy for that kind of speed. We will have coffee and donuts in the terminal building at 9:30, a short business meeting at 10:00 am and David's presentation will start at 10:30 am.

How many of you know about the Transcontinental Air Transport (TAT) airline? It was established in 1928 and was the first airline in America that provided coast to coast air service, sort of. Actually, passengers travelled from New York City to Los Angeles using a combination of both air and train transportation. Clovis and Albuquerque, New Mexico were two of the stops along the line. The Chief Pilot for TAT was Charles Lindbergh. The plane was the Ford Tri-Motor, an all aluminum aircraft that carried three crew members and nine passengers in first class luxury. Well, guess what, Chapter 691 is bringing the Ford Tri-Motor to Santa Fe, NM in September to give rides to the public. Want to experience a moment in history? Get a ride on the Tri-Motor. Our Chapter is hosting the event in cooperation with the Santa Fe Jet Center. We will be providing crew for ground operations and crew members will be eligible for a free ride. On top of that, by hosting and helping with the event, our Chapter will receive a commission check from EAA National for a portion of the proceeds. This will be a truly great opportunity for the general public to experience what it was like to fly a luxury airliner back in the day. Rides for the general public will cost \$95 for adults and \$65 for children 17 and under. That's pretty reasonable for a trip back to the world of aviation in the 1920s.



David Roe's RV-8 at the Del Norte, CO airport (KRCV).



The EAA Ford Tri-Motor that will be giving rides in Santa Fe, NM in September, hosted by EAA Chapter 691.



Member Happenings

I flew up to Del Norte Colorado to drop my Bonanza off for its annual Inspection. This is a pretty nice little airport nestled in the southern foothill of the Rockies. There is a nice pilot lounge and the airport has a courtesy car to take you to nearby Del Norte. "Del Nort" is a pretty little town on the Rio Grande river with a number of good places to eat. I highly recommend a visit sometime if you are in the area. By the way, the airport elevation is almost 8000' MSL so mind your density altitude.



Del Norte Kitchen, Lounge and Bathroom

PROTECT YOUR COWL!

John Graham

You may have seen in this newsletter that we finally got “Finder,” our RV-7A, painted late in 2022. That’s a story in itself: went to Wickenburg AZ to pick it up; found the battery dead; rainstorm by the time the battery was charged; overnighed in the only room left in Wickenburg (rodeo capital of the world, it seems); 2nd trip for pickup, battery problems again; push the plane 100 yards to self-serve and back (didn’t want to risk it not starting on 2nd try); finally returned by nonstop night flight to KSAF.

George, Harland, and I were extremely happy with the paint job, a beautiful “squadron blue” and with the truly artful job of giving a professional appearance to the fiberglass areas. A few months later, however, we noticed blisters appearing in several places on the fiberglass top and bottom cowl halves. These grew in number and size.





Though there was much puzzling (and some very credible opinions), the cause of the blisters is a moot point. Fortunately, the paint shop agreed to repaint the cowl under warranty, and Harland drove it down to Douglas AZ (this painting establishment has two shops in AZ). George went down to pick it up, bright and shiny, a few weeks later.



Meanwhile, we decided the cowl needed the best protection from heat and contamination it could get. I happened across an article in the March 2014 issue of Kitplanes on this very subject. It gave four approaches, from simply painting the cowl interior white, to a “nuclear option” of a riveted-on ¼” shield composed of aluminum foil and steel sheet with heat insulation between.

A surprising but fortunate discovery: Examining the inside of the newly painted cowl, Harland found some serious heat damage in a location that had been opposite the exhaust pipe joint on the left side. That area had been covered with FiberFrax, but either that wasn't enough or the damage occurred before it was applied. Regardless, Harland excavated the blackened material, honeycomb and some microballoons, which luckily did not penetrate to the outer shell of the cowl. No damage on the right side, though the cowl was a similar distance from the exhaust pipe. George did a great repair job, putting epoxy with structural fiber into the void and adding a layer of glass on top.



Stopping short of nuclear but being conservative, we chose to 1) seal the inside of the cowl with brushed-on West epoxy; 2) add a 1/16" layer of FiberFrax (1/8" opposite the exhaust pipes); 3) cover the FiberFrax with reflective foil; and 4) tape the edges to keep fluids like oil and water out of the FiberFrax.



We already had the West epoxy and found good prices on FiberFrax and foil. Also got some high-temp adhesives (caution: wear an organic vapor respirator if you use Pliobond—it's nasty) and tape that's good to 2000 degrees radiant heat. George ordered peel ply to make a smooth finish on the epoxy. Aircraft Spruce had a clamp-on reflective fabric heat shield that was added for good measure on the left exhaust pipe.

Time will tell how all of this will work, but it's surely better than bare or barely covered fiberglass facing those exhaust pipes.

I left out a lot of detail, but give us a call if you have questions.

Jared Haney and Jack Kaiser in front of Jack's beautifully restored Aeronca Champ. Jack says it flies slightly faster than a hot air balloon. With a Continental O-200 engine I think it does a little better than that :-)



Tech Corner

by Will Fox



Weight and Balance vs Spin Behavior

It was a good day to spin a new aircraft. The air was cool and calm. No cloud decks to worry about and visibility was excellent. Even so, the test pilot was a bit nervous. She always was, when it came to spin testing a new aircraft. As good as the engineers were, they still had trouble predicting spin behavior in new designs. Today, the spin testing would explore the recovery characteristics of the aircraft at rear CG locations. The goal was to find the rear CG limit with acceptable spin recovery characteristics. The FAA certification requirement for a single engine, normal category airplane was that after a one turn or three second spin, which ever takes longer, the aircraft must be recoverable in less than one additional turn. The engineers had rigged a gizmo behind the pilot seat that allowed the test pilot to adjust the CG of the aircraft while she was flying it. Basically it was a motorized trolley on rails with a weight on it. The trolley could be motored fore and aft on the rails to change the CG location. The pilot had a switch on the yoke, similar to a trim switch, that she could use to run the trolley back and forth.



Picture of a Cessna 150 entering a spin.

The plane had climbed to 12,000 AGL, and the pilot was cleared to begin the first spin test. She flipped the diagnostics switch that would turn on the data recorder and moved the trolley aft, to the first test position. She could feel a change in the pitch stability of the aircraft, but it still had good positive pitch stability. She cleared the area around her and below her, checked her altitude and heading, reduced power, and then executed a spin entry. After one turn she executed the recommended recovery technique with full rudder against the spin and centered the yoke. The rotation began to slow and then stopped in about half a turn with the nose pitched down. After the aircraft gained speed, the pilot pulled the nose up into level flight. She had lost about a thousand feet in the spin. She climbed back up to try another spin. The testing continued with the pilot gradually moving the trolley farther and farther back after each spin and recovery. The pitch stability of the aircraft remained positive, even though it was becoming less so, and the spin recovery was taking a bit longer each time. She finally moved the trolley to the rear limit that the engineers wanted to test. This would be the rear CG limit for the aircraft if it had acceptable stability and spin recovery characteristics. The pilot executed another spin entry and noticed that the nose did not drop as much as in the other spin entries. After one turn, the pilot executed the normal recovery technique. The rotation began to slow but did not stop in the required

one turn, in fact it did not stop at all. The nose began to rise as the aircraft continued past two turns. The test pilot neutralized the controls and tried the recommended recovery technique again. Once again the spin rate slowed, but did not stop. As the spin went through 3 turns the test pilot then tried an alternate recovery technique that involved pushing the stick full forward with full opposite rudder. Once again, the aircraft slowed, but did not stop spinning. The pilot glanced at the altimeter and noted that she had now lost 3000 feet. It was time to recover the aircraft before it entered a fully developed spin. The pilot activated the trolley and ran it forward to its stop. As she did so the nose of the aircraft began to drop and the spin rate began to accelerate. She then executed the recommended spin recovery technique and the aircraft rotation slowed to a stop. The pilot pulled out of the dive and leveled off. She noticed that her pulse rate had increased and beads of sweat had formed on her forehead. She reminded herself that had the change in CG not worked, she could have deployed the spin chute, and if that had not worked she could have bailed out. Never the less, being a test pilot could certainly be exciting at times. As she returned for landing, she thought to herself that the engineers would not be happy about having to move the rear CG limit farther forward than they had planned, but it was either that, or make some aerodynamic changes to the wing or empennage to improve spin recovery.

This story illustrates the possible effect of a rearward CG on spin recovery. An aircraft may have positive pitch stability behind the specified rear CG limit, but it may not have acceptable spin recovery characteristics. This story is based on an actual test pilot experience. I hope it is 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 and to remain within the CG limits.

Below are a few websites that you may find interesting on spins and spin testing.

The Four Steps of Spin Recovery

<https://www.boldmethod.com/learn-to-fly/maneuvers/the-four-steps-of-spin-recovery-explained-pare-recovery/>

Spin Testing Piper Tomahawk

https://www.youtube.com/watch?v=3b9etPV_yVQ&t=4s

Spin Testing a Beechcraft Twin

<https://www.youtube.com/watch?v=wzM1VoAnwvc>



This shows pictures of a B777 during testing where water stored in barrels replaces normal seats and is pumped fore and aft to simulate center of gravity shifts.

1929 EAA Ford Tri-Motor

specs...



Designed by: Ford Motor Company

Model: 4-AT-E

Manufacture Date: August 21, 1929

Required Crew: 3 – pilot, co-pilot, flight attendant

Power: Originally built with three 300 horsepower Wright J-6-9 Whirlwind nine-cylinder radials, refitted in 1950 with two 450-hp engines and one 550-hp engine

Weights:

Empty weight- 6,500 pounds

Gross weight – 10,130 pounds

Fuel Capacity: 231 gallons

Range: 570 miles

Wing Span: 74 feet 10 inches

Length: 49 feet 10 inches

Height: 11 feet 9 inches

Ceiling: 16,500 feet

Number Built: 199 between 1927 and 1931, only around 18 remaining

Cruise speed: 80-110 MPH



No. 146 of 199 Tri-Motors built between 1927 and 1931. EAA's Ford Tri-Motor (NC8407) was manufactured on August 21, 1929, and was purchased by Pitcairn Airways, which flew it up and down the East Coast of the United States in the late 1920s and early 1930s. Eastern Airways, the forerunner of Eastern Airlines, subsequently purchased Pitcairn Airways. In the mid-1930s, the airplane was sold and moved to Cuba, where it flew for a Cuban airline for several years and also spent time in Central and South America. In the 1940s, the airplane was flown in Idaho and Montana, transporting smoke jumpers who fought forest fires. At that time, the large 450 hp engines were installed. The passenger door was also converted into a square-jumping threshold, so that jumpers' equipment would not become snagged during an exit. The airplane was also used as a borate bomber that dropped chemicals on forest fires. In the 1960s, the airplane was part of an operation that flew around the country, offering rides to the public. In 1973, the airplane was at a tour stop in Burlington, Wisconsin, when a severe thunderstorm moved through the area, lifted the plane 50 feet in the air, and smashed it to the ground on its back. The airplane, which broke into three pieces, was considered a total loss.

EAA purchased the Tri-Motor from an insurance company shortly afterward and began the long process of restoring it. The 12-year restoration was completed in 1985. For the next six years, the Tri-Motor was on display at the EAA AirVenture Museum in Oshkosh, Wisconsin, and was only flown occasionally. In 1991, the airplane began regular passenger flights once again, based from the museum's Pioneer Airport. In preparation for her 75th birthday, during the winter of 2003-04, the airplane received a "makeover" through the kind generosity and many hours of hard work by Gulfstream Aerospace Corporation in Appleton, and EAA's own team of mechanics.



FEFORD_GenSup_2022_Digital_EAAFordPhotoFactSheet Rev 1/23

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: