



Paul Price's RV on a lovely morning

EAA Chapter 691 Newsletter

January 2024

On the Web @ eachapter691.org

EAA 691 is:

President: Will Fox

Vice President: John George

Secretary: Pierre Levy

Treasurer: David Young

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Young Eagle Coordinator: April Fox

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Upcoming Events

Upcoming Events

→ **Meetings Schedule (unless otherwise noted)** ←

9:30am - social time

10:00am - business meeting

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

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

Saturday January 20 @ Santa Fe Jet Center John Lorenz presents “Spins, Rolls, and Loops: Sandlot Acro”

Saturday February 17 @ Santa Fe Jet Center Jeff Gilkey presents “Obscure and Scenic New Mexico”

This
Saturday, Jan.
20



**Experimental Aircraft Association
Green Chile Chapter 691**

Location: Santa Fe Airport, Jet Center

**Meeting: January 20, 2024, social time (donuts and coffee) at
9:30 am, meeting at 10:00 am, presentation at 10:30 am.**

**Speaker: John Lorenz:
“Spins, Rolls, and Loops”:
Sandlot Acro”**



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

Obscure and Scenic New Mexico

by Jeff Gilkey



Next
Month!!

Jeff Gilkey has been flying his AeroTrike Cobra (ELSA, weight shift control) since 2004. He has logged over 2200 hours on cross country adventures into nearly every corner of New Mexico, with many extending into Colorado, Arizona, Utah and Texas. For more information, visit his YouTube Channel at <https://www.youtube.com/user/jefftrike>

Letter from the editor

by April Fox



Hi folks!

I'm excited for a new year as Chapter 691 continues to develop STEM workshops for the youth in our communities as well as an EAA Build and Fly RC airplane project. Keep an eye out in your inbox for updates and requests for volunteers.

I personally would like to put together a team of individuals who are interested in helping me develop some aviation STEM related projects, experiments, and lessons to teach at our future Young Eagles STEM workshops



April



President's Report

by Will Fox



Christmas and the New Year

Santa Claus flew into the Los Alamos Airport to check out who had been naughty or nice. The terminal was packed with kids and parents watching as Bobbi Huseman, the airport manager, cleared him to land. Kids sat on Santa's lap, treats were handed out, and they got their picture taken sitting in a Bonanza decked out with Christmas lights that was Santa's ride for the day. It was a good time for all, and it looks like Santa might be visiting a few more airports next year.

I can remember when the movie 2001 Space Odyssey came out in 1968 and it seemed incredibly futuristic at the time. Now, here we are in 2024, and I was thinking about just how far we have come since the 60s and 70s? The tallest building back then was the Empire State Building at 1250' tall. Now it is the Burj Khalifa which is 2717' high. The fastest plane back then was the SR71 at 2200 mph. Nowadays the space shuttle holds that record at 17,500 mph. The fastest computer in 1976 was the Cray-1 that clocked in at 240 million calculations/ second. Now it is another Cray called the Frontier that clocks in at a trillion million calculations/ second. That is 4 billion times faster. Do you remember HAL, the Artificial intelligence (AI) from 2001 Space Odyssey that took over the spaceship? Well today we have [robots that dance](#) and AI that can answer simple questions, help you cheat on your term papers, and [talk to itself](#). I expect it will run for office any day now. The production electric car was an oddity in the 1970's with the Citicar that was capable of only 60 mph and 40 miles of range. Today the Tesla Model S Plaid has a top speed of 200 mph and a range of 350 miles. The Saturn V was the most powerful rocket in the world back then with 7.5 million pounds of thrust. Today it is the Starship with 16 million pounds of thrust. We didn't reuse rockets back then, but now we have reusable rockets like the Falcon 9 that have reduced launch costs to low Earth orbit from \$10,000/lb to less than \$1000/lb. Oh, and one other thing, we have robots exploring other planets, and they can even fly.

Our January 20th meeting will be held at the Jet Center in Santa Fe. John Lorenz will be our guest speaker. John is a CFI and the president of the New Mexico Pilots Association. His talk is titled Spins, Rolls, and Loops: Sandlot Acro. It should be a good one. Donuts and coffee at 9:30 am, meeting at 10:00am, and the presentation starts at 10:30am. At the meeting we will discuss and vote on raising the membership dues to \$35/year with an opportunity for a family membership for \$40/year.



Santa Claus visited the Los Alamos Airport where wishes were told, treats were handed out, and kids had their picture taken in Santa's Ride.

One Electrical Gremlin Cornered

By Paul Price



Hi, and thanks to good friends for being a part of finding a solution to the electrical gremlin that has been plaguing N77L, my VANS RV9A.

Recap.

A few months ago, I flipped the main toggle switch, and nothing happened. My A&P suggested that it was the main power relay because the toggle switch is so simple it rarely fails. Enter my first mistake. Instead of confirming the main power relay was not working, I just went ahead and replaced it. It is not an easy replacement due to location of the mounting bolts and its proximity, and connection to the starter solenoid. This led me to replace both because I was into it so deep. That repair went well, the toggle switch lit up the panel, and away I flew. A few weeks later, I toggled the switch and the panel remained blank. I changed the toggle switch and the panel lit up, and again away I flew. A few weeks later, I toggled the switch and the panel remained blank. I was sitting in my cockpit with my head in my hands when a few minutes later the panel lit up!



Looking for help.

I relayed all of this into a new thread on Vansaircraft and several helpful builders chimed in about checking ground connections, which I did. A few days later, a post asked if I had diodes on the main power relay and the starter solenoid. Well, I knew I didn't, so I consulted more builder friends; Will Fox and David Roe. They confirmed diodes are very important as well as sent me a link to a YouTube video showing the reverse electrical pulse arcing across the contacts of a toggle switch. One generous builder/pilot friend, David, even sent me the diodes, power relay, and starter solenoid he had recently removed from his VANS airplane, all in good working condition. I installed the diodes and a new toggle switch. I confidently toggled the main switch and the panel remained dark. Assuming, again, the main power relay (that was recently installed) must have been faulty all along, I mostly maintained my composure and replaced the main power relay with the one sent from my generous friend. Of course, I re-installed the diode. I toggled the main switch and again, nothing happened.



Breaking Through

After some serious soul searching and self-therapy (aka lots of stomping around talking to myself) I did what I should have done back on day one. I toggled the main switch and listened carefully. I heard the familiar clunk of a relay closing. I did it again. I heard it again. OK, well if it's closing, is it sending power anywhere? The panel was dark, and the plane was silent. I got out my multi-meter and did the Fossberry flop which positioned my head under the instrument panel. The voltmeter showed 12.6 volts on each item connected to copper distribution buss until I came to *this*.

A little jumper cable known on the VANS diagram as P13. The right end of P13 showed 12.6 volts and the left end showed 3.3 Volts. Each item on the second copper buss showed 3.3 volts.

Positioned again in front of the panel, I started toggling the switches from the far left. Each switch on the first buss work perfectly. Nothing on the second buss would work including, of course, the instruments on the panel.



I called Vansaircraft builder support and explained what I was seeing. Kevin said that it's very unlikely for this jumper cable to fail after working perfectly for nearly 20 years, but if there was anything loose or compromised it could quite "emphatically" behave just as I was describing.

With little hope that this could be the remedy, I removed P13, looked it over, gave the terminals a good tug, and headed for electrical supplies to fabricate a new one. While looking at the rack of terminal connectors and fiddling with the jumper in my hands, I heard something metallic hit the floor. One of the terminals had actually fallen off and was lying at my feet. The exposed strands of cable were charred with carbon and upon closer inspection I could see that that half of the cable insulation had half-melted and shrunk against the strands transmitting their texture through the plastic.



New Hope

With new hope I found the connectors, a new piece of cable, and fabricated a duplicate jumper cable. Then I remembered that the note on the VANS diagram said the P13 cable was used to connect the two copper busses because they laid at different angles across the switches and breakers . . . but mine didn't. The two busses lay perfectly aligned with each other. The ultimate replacement for P13 is hopefully a better and more reliable solution.

Since the installation, I have switched the main power toggle a dozen times and flown four flights. Everything is working perfectly. Should I wait a few weeks before really breathing a sigh of relief? At the expense of embarrassing myself, I share this story hoping it is useful to fellow aviators and builders out there.

Your comments, other than “duh”, are welcome.

Validate your hypothesis before implementing!

It's Here! It's Here!

By Walt Atchison



Chapter 691 Has Received It's Very First Build and Fly Kit!

The Young Eagles Build and Fly program is an intensive RC model building and flying initiative to introduce kids to aircraft construction and the fundamentals of flight. This program can either be a follow-up to or lead to an EAA Young Eagles flight for each youth participant. The build process and subsequent flight training with both a provided RC flight simulator and the finished model. We expect youth participants to learn as much during the build process as they do during the flying portion. The model should be completed through multiple build sessions, intermixing aircraft construction and flight theory into each session both at the build location and flying field which for us would likely be at Soccer field at Overlook Park in White Rock on Sundays with our local AMA group.. Relationships between EAA chapters and local AMA clubs are paramount to successful Build and Fly programs. AMA clubs are where technical expertise is found pertaining to building and flying RC model aircraft. They are also the avenue for flying the finished. Chapters and clubs will mutually benefit from the program's activity, youth engagement, and bringing members of both organizations together for a common program. This is an opportunity to nurture individuals' interest in aviation and to gain new friendships based on this shared interest, with the potential long-term goal of becoming a pilot.



Almost everything you need to build and fly the LT-40 eKadet, which has a 70 inch wingspan, is included in the box along with a RealFlight 9 RC simulator and Night Vapor Ready-to-Fly indoor airplane. The only things the chapter and club need to provide

Be on the lookout for information regarding chapter volunteer positions!

Skip Builds a Flight Simulator (that you sit in)



“My simulator is not intended to be a finished product (although it might end up as one) but rather a prototype to allow the chapter to experiment, make mistakes, and LEARN what we might need in future flight simulation tools.”

–Skip Egdorf on his homebuilt flight simulator

Homebuilders Week

By Charlie Becker, EAA
Homebuilt Community Manager

Homebuilders Week – **Online Event Starts January 22**

An online opportunity to learn about building your own aircraft

Homebuilders Week is an online opportunity to carry on the founding mission of EAA by sharing as much knowledge and information about building your own aircraft as possible in five days.

We start on Monday, January 22nd, 2024, and end on Friday, January 26th, 2024. Each day, we offer six live webinars back-to-back, starting at 11:30 am central time and running every hour and a half until the last session at 7pm central. The sessions are live and allow time for questions. To sign up for the sessions, visit www.EAA.org/HomebuildersWeek

The topics cover a wide variety of areas of interest to anyone curious about building their own aircraft. We try to make sure there is something for everyone, whether you are just considering the idea of building an aircraft, are knee deep in a project or getting ready for test flying. We even have EAA president Jack Pelton lined up on our anniversary date, January 26th, to talk about EAA's Advocacy efforts on behalf of the homebuilt members.

EAA Homebuilders Week coincides with the anniversary of the founding of the Experimental Aircraft Association in 1953. We have come so far since that first EAA meeting. Back then, information on homebuilding was sparse and hard to come by. I know that if our founder, Paul Poberezny, was still with us, he would give us a big thumbs up for this effort to support the homebuilder.

EAA Homebuilders Week is made possible through the generous sponsorships of Aircraft Spruce & Specialty Co., Dynon, and Scheme Designers, Inc.

Visit www.EAA.org/HomebuildersWeek to sign up.



Homebuilders Week Schedule

January 22 - 26, 2024

To sign up: EAA.org/HomebuildersWeek

Time CST	Monday 1/22/24	Tuesday 1/23/24	Wednesday 1/24/24	Thursday 1/25/24	Friday 1/26/24
11:30-12:45	Building an Aircraft: What You Need to Know Charlie Becker	Composite Construction Basics Mark Forss	Amateur-Built Certification Process Joe Norris	Lies, Darned Lies, and Homebuilt Accident Statistics Ron Wanttaja	EAA Advocacy Update: Top Homebuilding Issues and the Impact of MOSAIC Jack J. Pelton, Sean Elliott & Rob Hackman
1:00-2:15	Wiring Basics Dick Koehler	The Nuts and Bolts of Nuts and Bolts Kerry Fores	Building on the Cheap Ron Wanttaja	Lycoming Engine Installation Dave Prizio	Working With Wood 101 John Egan
2:30-3:45	Welding Basics: Gas & TIG Charlie Becker & Tracy Buttles	Fabric Covering Basics Nate Hammond	Buying a Used RV Aircraft Vic Syracuse	Sonex Aircraft and AeroConversions Products Mark Schaible	Zenith Aircraft Kits & Plans Sebastien Heintz & Roger Dubbert
4:00-5:15	Sheet Metal Basics Jim Scott	Factory-Built to Homebuilt: What's the Difference? Tom Charpentier	Advanced Flight Systems Rob Hickman	Garmin Experimental Avionics Solutions Brad Brensing	Scratchbuilding From Plans: 90% Done and 90% to Go! Marty Feehan
5:30-6:45	Panel Planning and Wiring Marc Ausman	Dynon Avionics Michael Schofield	Flight Testing 101 Paul Dye	Propeller Selection for Homebuilts Steve Boser	Latex Paint: A Low-Cost Alternative Malcolm Morrison
7:00-8:15	Rotax 9 Series Installation & Operation Phil Lockwood	Painting Your Plane: DIY or Use an Expert? Craig Barnett & Ken Reese	Engine Break-In Mike Busch	Van's RV Aircraft Kits Greg Hughes	Common Builder & Maintenance Errors Vic Syracuse

Sponsored by



Tech Corner

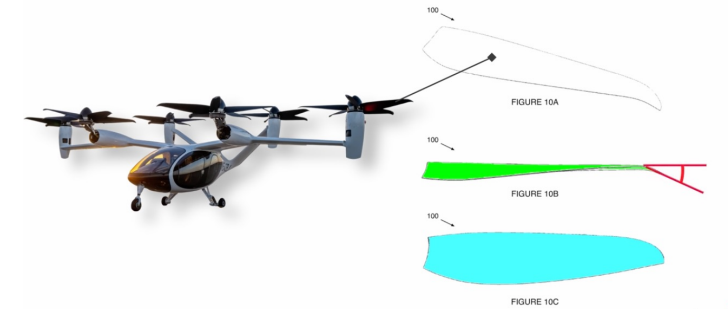
by Will Fox



Peace and Quiet

Imagine flying from point A to point B in a light aircraft or helicopter and not having to wear a headset to protect your hearing, and you could talk to each other in a normal voice. Wouldn't that be great? The creation of electric aircraft is heralding the development of quieter propellers that may benefit not only Electric Vehicles (EV) but also Internal Combustion Engine (ICE) aircraft. Joby Aircraft, which has begun producing a Vertical Take-Off and Landing (VTOL) EV to provide low-cost air travel in urban areas, has demonstrated exceptionally low noise levels with an advanced propeller design. The propeller incorporates five blades that have a broad tapered planform that is twisted along its length and ends with an angled tip. Joby acoustic tests have shown a marked reduction in noise signature when compared to both fixed wing and rotary wing aircraft. The Joby is so quiet in hover that people can have a normal conversation 150 feet away. The design of such a quiet propeller does result in a 3% loss of efficiency while the aircraft is hovering but does not affect efficiency in cruise.

Others are also looking at reducing propeller noise. Researchers at the Massachusetts Institute of Technology (MIT) have come up with an idea for a toroidal propeller that substantially reduces the noise signature of drone aircraft. The propeller, which looks like its blades have been twisted in a figure eight, has no tips, and as a result distributes the tip vortices over the entire blade rather than just at the tip. This in turn spreads the resultant sound frequencies over a broader range that is less annoying. It turns out that humans are particularly sensitive to noises in the 0.1 to 5 kilohertz range. The vowels we use in normal communication occur in this frequency range as does the sound a crying baby makes. It is easy to see why sounds



Joby Aircraft uses an advance blade design to reduce operational noise.



Joby Aircraft noise signature is much less than similar fixed wing and rotary wing aircraft.

in this range get our attention and can interfere with normal conversation. Toroidal propellers produce a sound much more like a “rushing breeze” according to the MIT researchers.

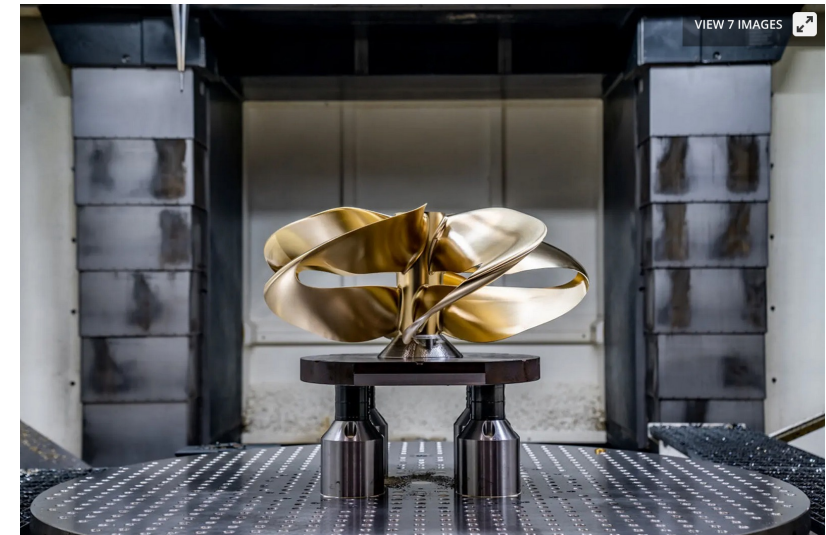
The toroidal propeller design has also demonstrated large increases in operating efficiency in power boats. Sharrow Marine is a company that is a leader in the development of toroidal propellers for this application. Efficiency increases of over 100% have been measured in the midrange operating rpm for power boats. This results in fuel savings while improving acceleration and reducing propeller noise. They claim that it is possible to have a normal conversation while doing 30 mph in a power boat using a toroidal propeller. A CNC machine is required to produce the complex shape of the propeller, and, as a result, it is significantly more expensive than a traditional one. The developers believe the additional cost is small in comparison to the benefits and to the overall cost of owning and operating a power boat.

The use of a toroidal propeller for a power boat application to increase efficiency and reduce noise is pretty clear. In an aircraft application of scale, it is not so clear given the added weight and cost associated with the shape. Further research is needed in this area, and only time will tell whether toroidal propellers will replace more conventional designs in the future.



MIT’s toroidal propeller design is used to reduce the noise signature on drone aircraft.

Toroidal propellers can increase efficiency and fuel economy in marine applications.





Clickbait

For those who might not have seen it, this [article](#) shows how to put a widget for [aviationweather.gov](#) on your mobile or desktop so it acts like an app. Pretty handy.

An interesting video on survivability based on your emergency landing medium (i.e. roads, fields, water, trees...)

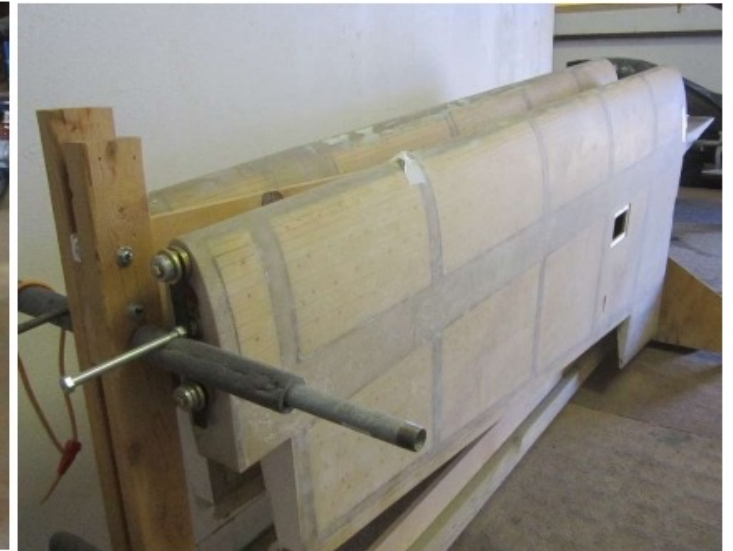
<https://www.youtube.com/watch?v=IxP-RZ77Les&t=4s>

Project for Sale – Make an Offer!
Aircraft Technologies ACRO 1
fast glass aerobatic single seat

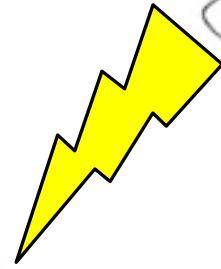


- 220 mph cruise
+/- 15 G ultimate loading
About 85 % complete (really!)
- All fiberglass work complete except for surface finishing
 - Kit converted from tail dragger to tri-gear
 - Lycoming dynafocal engine mount installed
 - Virtually all parts and materials to complete, including controls, fuel, electrical, avionics and much more
 - Excellent documentation of the build to support airworthiness certification
 - Located Albuquerque, NM USA

Email Warren Cox:
wbcx@comcast.net



Hey Kids! Keep an eye out for upcoming work sessions to Electrify the Dragonfly!



Dragonfly

Illustration From CONTACT Volume 2 Issue 2
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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: