



HIGH SIERRA FLYER

Newsletter of Sierra Chapter 403

2500 East College Parkway, Carson City, NV 89706

+1-858-774-1060 | contact@eaa403.us | eaa403.us

Volume 1 Number 7 | August 2025

FROM THE VICE PRESIDENT

Meet Rowdy Miller



16 year-old Rowdy is this year's Ray Scholarship winner. She is currently in flight training at NV Flight in Reno. Rowdy has recently soloed in

a Piper Cherokee and is making progress toward her Private Pilot Rating.



Her interest in aviation started when she was very young. She was inspired by hot air balloons and then a visit to the Reno air races. Her ultimate goal in aviation is to become an aerial firefighter.

Rowdy has a strong interest in science and physics. When she is not flying , you might find her practicing martial arts, violin or bass guitar. She is also very active with her robotics team.

Chapter 403 is proud that Rowdy made it through our tough scholarship selection process and that she continues to work toward her aviation goals. Let's welcome her to Sierra chapter 403 membership!

FROM THE SECRETARY

Happy August!



Well, after nearly twenty years of shepherding the Zodiac build, Jim Nunnelee finally got to enjoy the fruits of his efforts. Jim flew around the pattern with owner pilot Larry Jones who, with the help of his EAA friends finished the project last year. The smile says it all!



As we begin planning this year's Christmas Brunch, I want to remind everyone that we would welcome the donation of items for door prizes.

Suggested items include gift cards, home goods, food baskets, etc. Do you have a collection of small items to donate?

Thanks to our Volunteers!

Bring them in, as you may have the basis of a gift basket. Email me at secretaryeaa403@gmail.com with any questions.

As a reminder, the EAA offers a variety of valuable webinars each month, here is a list of the August sessions:

August Webinars at EAA.org

[Project GADfly Update](#) | Qualifies for FAA WINGS and AMT credit. Wednesday, August 6, 2025, 7:00 - 8:30 p.m. CDT with Mike Busch

[MOSAIC IS HERE!](#) | Thursday, August 7th, 2025, 7:00 p.m. CDT

[Critical Airspeeds for Safe Flight Operations](#) | Qualifies for FAA WINGS credit. Wednesday, August 20, 2025, 7:00 - 8:30 p.m. CDT with Catherine Cavagnaro

[The Possible Impossible Turn: Engine Failure on Takeoff](#) | Qualifies for FAA WINGS credit. Wednesday, August 27, 2025, 7:00 p.m. CDT with Gordon Penner

FROM THE TREASURER

Balances as of 1 Aug:

- Savings: \$72,368.42
- Checking: \$5,487.29
- PayPal: \$00.00

Previous PayPal funds were transferred to the checking account. Detailed monthly reports are posted in the Chapter House and available by email upon request.

GUEST SPEAKER

At our 6 Aug general meeting, Logan Larsen will be talking about his Air Academy experience at Oshkosh last month.

Larry Crapo will also talk about his experience as a Bell Helicopter Maintenance Instructor in Iran during the Iranian Islamic Revolution. He wrote a book about his experience titled, "Stay & Die".

IMC CLUB

The group meets the third Thursday of every month at 1800 in the Chapter House.

VMC CLUB

The group meets the fourth Thursday of every month at 1800 in the Chapter House.

YOUNG EAGLES

Bryan, the owner of High Sierra Pilots, will loan the Chapter, at no charge, up to two Cessna 182s for Young Eagle flying events with at least a one week notice.

The pilot must be a High Sierra member and pay for any gas used. If you are a member of High Sierra Pilots and willing to fly for Young Eagles, please contact Larry Crapo at youngeagles403@yahoo.com.

Our next Young Eagles rally is 16 Aug.

MEMBER CLASSIFIEDS

Gary Childers has two projects for sale:

1. Bowers Flybaby
2. Mitchell U2 with Rotax 277

Email him at lloydllc2@gmail.com and he'll send you more info and builder's logs in PDF format.

Sandy Munns has a project for sale:



EAA Acrosport single seat, with EAA Biplane wings (two ailerons, rather than four). Mostly complete. Needs engine, fabric, final assembly. Includes: completely welded fuselage, tail feathers; LG legs with Cleveland wheels and brakes; two engine mounts, one

dynafoal, one standard; fuel tank and smoke oil/or header fuel tank; fiberglass turtle deck; Cabane strut completed; all four wings completed; Scott tailwheel; all control linkages; fiberglass turtledeck complete; sheet metal and nose bowl for cowling complete. Includes EAA biplane and Acroport plans. All original work done by an A&P mechanic. I don't have the time, \$\$, or a place to finish it, so it has to go. \$1,500 OBO. Lycoming O-320 rebuildable core available separately.

Contact Sandy at 775-224-3473 for more details or to see it.

TECH TOPICS

Building a Custom Exhaust System -Larry Grant

As a teenager, I read a lot of hotrod magazines and have always been drawn to the technical and performance aspects of contraptions with reciprocating engines. Headers, electronic ignition, high lift and longer duration camshafts, fuel injection, bigger valves, port and polish, high flow intake manifolds, superchargers, turbochargers – and the list goes on.

With those teenage years long in the rearview mirror, in Jan-Feb of 2019, I was, ostensibly, an adult finishing a Tailwind build. It was 80% complete with only 80% to go. The ship was coming together nicely, but I thought the engine exhaust system was below par and, to some extent, a bit of an eye sore.

Thanks to our Volunteers!



Fig.1: The original Tailwind exhaust system.

I had previously read the CAFE* reports on their well thought out and controlled exhaust research project. Locally it was cold and typically snowy weather, and I had nothing to fly. And, since I knew a welder, I thought: "why not make a state of the art exhaust system based on CAFE guidelines! Maybe I'll stumble across some free horsepower."

** The CAFE Foundation is a U.S. non-profit aviation development and flight test organization based in Windsor, California. CAFE was originally an acronym for "Competition in Aircraft Flight Efficiency" and later became "Comparative Aircraft Flight Efficiency." The organization promotes experimental aviation activities which support the development of highly efficient aircraft. It is sponsored by many organizations including Boeing Phantom Works, NASA, EAA, AOPA, Glasair Aviation, among others; and funding is also obtained through an FAA grant.*

I discussed the project with Ron Sutton (certified aircraft welder and founding member of Chapter 403). He was game, so the project was born.



Fig.2: Ron Sutton's home-shop.

Here are some of the strategy and design thoughts that went into planning the exhaust system:

1. Header Diameter & Length

The fourth and final CAFE report on aircraft exhaust systems (Reference 1) concluded that optimum header tubing size for this engine at 2500 to 2700 RPM at sea level appears to be 1.75" inside diameter (ID).

And the length of the headers for a 4-into-1 collector seems optimized at about 28" to 36". Longer than this guideline probably raises backpressure and delays the onset of scavenging while shorter lengths reduce the ability to contain a fully developed, powerful wave that promotes good exhaust flow.

The engine they used for testing was a Lycoming O-360. Optimizing for a 10,000 MSL cruising altitude or a smaller engine would suggest using smaller tubing in the 1.625" or 1.5" ID. For my O-235, I went with 1.625" pipes, somewhat dictated by the tubing size of weld-up kits available from the automotive speed shops.

My runners are not identical in length but the four of them do fall into a 4" window of 29" to 33". Good enough! If doing it again, I'd find a way to go with 1.5" pipes – which are better for high altitude cruise and create a smaller package to fit into the available space.

2. Tubing Material

Stainless steel is slightly heavier than mild steel, so I went with mild steel to reduce weight. The price of stainless had nothing to do with that decision.

3. Tubing Connections

Springs and slip joints supposedly reduce potential cracking of welded joints, but they also seem to bring as many problems as they solve. So, I did some research and discovered some useful anecdotal evidence in favor of welded joints over slip joints.

One commenter eliminated springs and slip joints with the understanding that the welded joints might be more

susceptible to cracking. But he observed “I am still waiting for one to crack so I can fix it.” He also noted that “with the pipes welded together the whole system is very strong and there is no loose end to shake and cause a crack.” He mentioned a Rutan VariEze that crash landed and ripped the main gear off had all the weight of the aircraft sitting on the exhaust system and all it did was bend the collector flat on the bottom. It did NOT crack any welded joints!

System Design

Designing and fitting the system fell to me. I already had four stainless flange-stack combinations that came off of a GPU and I bought a weld-up kit at Summit Racing in Sparks. I also bought a 4-into-1 collector and a 2.25” collector-exhaust pipe via mail order. It soon became a process of picking suitable bends out of the kit, cutting them to size, tack welding several smaller pieces together and then delivering that temporarily-assembled runner to Ron for final welding.

After the individual runners were all complete, the collector was prepared and then welded to the 4 runners. Then came the exhaust pipe and finally sometime later I fabricated a heat muff that goes around the collector.

The designing, fitting and welding of the exhaust system (sans heat muff) took about a month, with alternating down

time while one party was waiting on the other. After the system was complete, I had it sandblasted and then I gave it two coats of a high temperature paint (black).

So far the system has proven durable – with no cracks in about 100 hours of operation. Paraphrasing Spike Lee, “Must have been the world class welding!”

Originally fitted to a Tailwind, this exhaust system was later pressed into service on a Jodel (Falconar F-12) and, amazingly, it fit without modification. Sometimes good things just happen. The series of events that lead to installation on the Jodel is a whole ‘nother story (or book) in itself.

One final thought: this project would have been much more difficult if done in a nose-wheel aircraft – which has much less room around the engine due to the presence of the nose gear.

Below are some photos that help tell the story and saves me about 13K words:



Fig. 3: Fitting the number 4 runner first – farthest from the collector location. The number 2 stack is in place as a guide for clearance.



Fig. 5: The number 2 and 4 runners have been fitted into the collector and are clamped in place waiting to be tack welded.



Fig. 4: The number 2 runner is tucked just below number 4.



Fig. 6: The number 1 runner has been fitted into the collector and is waiting to be tack welded. Numbers 2 and 4 have been final welded. Note the braces between runners.



Fig. 7: The number 3 runner has been final welded. All four runners are now fitted, final welded and in good position for welding into the 4-into-1 collector.



Fig. 9: Ron preparing to join the pipes with an interior flow separator that will go into the 4-into-1 collector.



Fig. 8: Collector and exhaust pipe trial fitting. The exhaust pipe was subsequently cut up high to achieve a vertical angle.



Fig. 10: Exhaust system nearing completion – what a handsome welder!



Fig. 11: Exhaust system after sandblasting. The bracing between individual runners is more visible in this shot.



Fig. 13: Repurposed Tailwind exhaust system installed on Jodel. Note installation of Exhaust Gas Temperature (EGT) probe in the left pipe.



Fig. 12: A little bit of this paint goes a long, long way.



Fig. 14: Number 2 & 4 runners in the Jodel installation.



Fig. 15: Lucky fit of the exhaust pipe under the Jodel fuselage. I'd rather be lucky than good! Note the small heat shield just above the exhaust pipe.

For More Information

Reference 1: AIRCRAFT RESEARCH
REPORT Aircraft Exhaust Systems IV

https://cafe.foundation/v2/pdf_cafe_reports/EPG%20PART%20IV.pdf

FROM THE EDITOR **Local Area Orientation**



Michaela taxis to the hangar after our flight.

My local area orientation in a slow draggy aircraft (a light sport “trike”) with Michaela Flint was great! And I verified

that I’m OK in a completely open cockpit. It’s funny that a healthy fear of heights while climbing a crumbling hillside goes away when strapped to a capable flying machine.

We took off from runway 27 and departed to the south. In Carson Valley, we turned west and continued climbing at around 600 fpm to 10,000 MSL to pass through Daggett Pass (Kingsbury).

Then we flew west along Tahoe’s south shore and got clearance from the temporary tower to do a touch-and-go at SLT and depart northbound.

I pointed out some “catspaws” (wind-generated disturbances on the lake’s surface) as we headed north along the east shore with me flying. Again, we climbed to 10,000 MSL to attain ground clearance and then flew through Spooner Summit pass.

After clearing the pass, we turned north and entered Washoe Valley, descending at about 700 fpm with Michaela on the controls.

We discussed flying safety when at low altitudes, including flight planning for any towers, powerlines, or cables that might be an obstruction, and doing in-person recon before going low over an area.

We flew over a little meadow and saw a herd of wild horses, keeping our distance

so we wouldn't spook them. Michaela explained that the sound of the Rotax 912 doesn't seem to scare them, but if the shadow of the wing passes over them, they startle – probably thinking it's a giant bird of prey!

We turned south and climbed again to pass over the mountains at the south end of Washoe Valley, then descended north of our Airport, making a couple circles for spacing with two other aircraft in the normal pattern for runway 27.

We passed southbound over midfield for a "teardrop" entry into a downwind 45 for runway 27. Even though there were no fast twins or jets in the pattern, we passed a bit over their 1500 AGL pattern anyway just for more vertical separation.

After overflying the field, we descended while southbound for probably 3 miles or so past the airport, then did our right teardrop for 45 entry to downwind while already AT pattern altitude.

Our downwind and base legs were uneventful, and when we turned final, Michaela pointed out the gravel mining operation at the east end of the runway.

Although the wind was calm when we started our flight, a variable north wind had come up, and there was a little turbulence for our final approach, and a slight right crosswind for landing.

The flight was a blast, and I now have a third logbook (for Weight-Shift Control) to add to my existing ASEL and glider logs.

CHAPTER OFFICERS

President

Robert Grant, 915-241-1330

Vice President

Mike Hardison, 858-774-1060

Secretary

Patricia Jones, 661-733-6364

Treasurer

Mike Zieba, 775-343-5948

Board at Large

David Baird, 785-648-0141

Board at Large

Dayton Murdock, 775-721-9476

Board at Large

Randy Vogelgesang, 530-545-1876

Young Eagles Coordinator

Larry Crapo, 310-200-1912

Ray Scholarship Coordinator

Mike Hardison, 858-774-1060

IMC Club

Tim Rowe, 775-233-8008

VMC Club

Dale Smith, 858-212-1896

Technical Counselor

Jim Nunnelee, 775-790-1396

Dayton Murdock, 775-721-9476

Pancake Breakfast Coordinator

Larry Grant, 775-842-0493

IT / Web

Mike Zieba, 775-343-5948

Newsletter

Gary B Swift, 775-790-6723