EAA691
DECEMBER 2025
CHAPTER NEWSLETTER

Piper PA-18
Moose Pass, Alaska
photo credit: Andrew DeVecchio

www.eaachapte691.org

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WHO WE ARE

President: Will Fox

Vice President: John George

Secretary: Pierre Levy

Treasurer: David Young

Board Members: Andrew DeVecchio

Keith Tschohl

Web Editor: Marilyn Phillips

Newsletter Editor: Andrew DeVecchio

Young Eagles Coordinator: Gary Goddard

Young Eagles Workshops: Walt Atchison

Member Count: >35

November Re-cap

We held our annual Chapter meeting on November 15th and unanimously passed the amendment to our Chapter Bylaws regarding the Chapter Hangar. Thank you all for your votes and proxies.

Officers and Board Members were unanimously approved back into their positions as well. We are also welcoming a new Board Member, Keith Tschohl.

Skip and Will held their field repair demonstration on composite props. We all got a hand in testing out a mock repair and pontificated on all the different possible factors that could affect this repair.

Skip demonstrating the repair on a mock-up using CA glue and baking soda

Upcoming Events

Saturday December 13th

2025 EAA Chapter 691 Holiday Party

Tis time for the internationally recognized EAA Chapter 691 Christmas Party
Time: 11 AM
Place: 819 Gonzales Rd, Santa Fe
Questions: 505 920 6650

As in years past we will have our gift exchange, and exchange again and exchange again. If you have been to past parties, you will understand. If this is your first you are in for something different. Each person should bring a gift valued at about $15, can be new or used but should be worth at least $15 and if used be in good condition. If you forget the gift you will have to rotate the tires on my car.

This is a potluck so bring a favorite dish enough for yourself and one other person. There is always a lot of food and VERY GOOD food at that. Wear a belt you can loosen. You don't have to but if you tell me what you will bring (entree, dessert, salad) so I can keep the membership appraised so we don't have all deserts. An RSVP would be nice. (chatayoung@gmail.com)

David Young

Upcoming Events

Saturday December 13th

2025 EAA Chapter 691 Holiday Party

Letter from the Editor

by Andrew DeVecchio

You may have noticed a few changes around here. Well, April Fox, our beloved editor, is moving up to Colorado and, unfortunately for you all, the newsletter is now in my hands. To put it briefly, we're moving from an educator to an artist, so brace yourself.

All jokes aside, we will obviously miss April, and I'll be doing my best to carry on her legacy. I've decided on a quick overhaul of the look (I'm an artist; it's what keeps me motivated), and I'll be working on a few new columns. I'll be adding a weather report I'm calling *The Flyers Almanac*. Although many of you are probably used to the weather around here and know what to expect, some of us are new and/or could just use some friendly reminders on what to watch for.

Along with the weather, I'm working on a column called *Catching Up*. Intended to remind us of some of the basics we learned in our early private pilot days, this section will cover questions and topics you'd likely see on the PPL written exam. We could all use some friendly refreshers on this stuff.

As you'll notice, I'll be using ChatGPT and similar AI tools to help write these articles. I'm not the greatest writer, so having this help will make things much easier on me. You'll see it noted when I've used AI so it's always clear when and how it has been implemented. This brings me to two very important points:

1. **Worried about robots taking our jobs?** Well, you're in luck, because I could use some help writing articles. Do you have experience with New Mexico winds? Maybe you'd like to take on the weather report. Got another idea you'd like to see in the newsletter, or photos you'd like to share? Let's see what brings you to EAA691. I can always use your submissions, and I'm sure we'd all love to see them. Email me at *helloeditor691@gmail.com*.
2. **Did I get something wrong?** I'm doing my best here, but I imagine I'll get a few things wrong along the way. It won't hurt my feelings, and it'll help me set the record straight. I'll be sure to publish any revisions. Email me at *helloeditor691@gmail.com*.

On a personal note, I've been flying a lot lately, though unfortunately not from the seat I'd prefer. As I write this, I'm in seat 8F (always the window) on SWA2971 to PHX. My goal is to redirect some attention back to my own flying. I've been wrapping up various projects and will finally have some time to return to my own plane, N39RW, a Kitfox Series 5. Will Fox had a great suggestion about including this story in the newsletter, and I'm making it my mission to provide monthly updates on getting it flying again. Honestly, it doesn't need much, just the time and focus I haven't been able to give it. Follow along, and feel free to send input.

I'll sign off with this: It's been a pleasure being part of this chapter. When I met Will 3 1/2 years ago, I knew I was with the right people. He opened his hangar to a stranger and we traded stories. He told me about the Dragonfly Project and the plan to convert it to electric. I like pushing boundaries and seeing where things can go, and today that very project is well underway. It's impressive to see all the different skills this chapter brings as we push it forward. To be honest, I don't know half of what Will, Skip, Roger, and the rest are talking about when they're working on it, but I'm learning a lot. Follow along for updates on this project in the newsletter. **— Andrew**

Presidents Report

by Will Fox

Life is like riding a bicycle, you must keep moving forward to keep your balance – Albert Einstein

EAA Chapter 691 Christmas Party

Our annual Christmas party will be on December 13th, 2025 (this coming Saturday) at David and America Young's house located at 819 Gonzales Road, Santa Fe, NM, 87544. The festivities will start at 11:00 AM. Bring a dish for the potluck and an "interesting" gift (I usually find something around the house or hangar that is headed to the thrift store) for the White Elephant gift exchange. We will have a short business meeting to give out service awards followed by a video of the past year's happenings and then see what kind of crazy gifts people came up with. The Christmas Party is always fun and a great gathering of friends. I've even heard of spouses having a good time at the Christmas Party. I hope to see there.

The EAA Hangar was donated to the Chapter last month. We now have a permanent home for our activities and programs. Now all it needs is a few Christmas decorations☺️

After a very successful summer and fall campaign to get the Dragonfly disassembled, inspected, and repaired, (we had a great project team working on it) the weather turned cold on us so we decided to stop regularly working on it. Thanks to all of our members who joined in the regular build sessions we got a lot more done than I expected. We are now waiting for parts to arrive to begin the modifications that we have planned, like new brakes, wheels, and fairings, new firewall forward, and new panel and instruments. I'm an optimist, but we might actually get the Dragonfly in the air by this time next year if we keep this up☺️☺️.

Check out our Chapter YouTube channel for the latest videos at
https://www.youtube.com/@eaachapter691
For a schedule of upcoming events, go to the Chapter website at
https://www.eaachapter691.org/upcoming-events/

Flyers Almanac

December flying in Northern New Mexico

by ChatGPT / Andrew DeVecchio

Winter winds, clear air, and mountain dynamics define December flying in north-central New Mexico.

The month brings a blend of calm, crisp mornings and abrupt wind shifts driven by passing troughs and high-altitude wave activity. Prevailing westerlies often slide over the Jemez and Sangre de Cristo ranges, producing light to moderate surface winds but occasionally strong mechanical turbulence near ridgelines and mesas—especially around Los Alamos Airport (LAM). Pilots can expect improved climb performance thanks to the cold, dense air, but early-morning frost, black ice on ramps, and the need for preheating are all routine considerations.

Visibility and vertical motion are the real variables of winter flying here.

While Santa Fe (SAF) enjoys many blue-sky days, high-based snow showers and “snow virga” can mask pockets of turbulence and brief reductions in visibility. Wave clouds, lenticular formations, and sharp downdrafts are common when winds aloft exceed 25–30 knots from the west. Pilots operating near the canyons and mesas should maintain generous terrain clearance and be prepared for localized rotor activity on windy days. December offers spectacular flying—sunlit peaks, stable air masses, and quiet traffic—but it remains a month that rewards thoughtful briefings, wide margins, and respect for the mountains.

Expect:
Temp 43-17°F, snowfall 8", sunshine 6.9 hours, wind 8 @ 270°

Tech Corner:

Aircraft Oil Filters

by Will Fox

Just how good are reusable aircraft oil filters compared to the disposable ones? It turns out that the Champion and Tempest disposable ones do a much better job of filtering your oil than a Challenger reusable one. Which disposable oil filter is better, Champion or Tempest. The Champion oil filter is better and captures significantly more of the wear causing particulates than the Tempest. But interestingly, a WIX automotive disposable oil filter does a better job of that than either of those two. Read on if you want to know which of the oil filters cost less over the life of the engine and which have less environmental impact. Also learn what you need to know before ever considering using an automotive oil filter on an aircraft engine.

The oil in your aircraft engine needs to be filtered for three fundamental reasons, (1) is to capture macro sized pieces coming off the engine that are carried along by the oil so they don't do more damage, (2) to capture micro sized pieces of your engine that will cause accelerated wear in the engine if allowed to circulate with the oil and (3) to provide an opportunity to inspect and diagnose any possible problems that may be developing before they become big ones.

Which oil filter is better for your engine, the reusable Challenger (above) or the disposable Champion (below) oil filter?

Back in the day, many Lycomings and Continentals didn't have paper oil filters, just a coarse suction screen in the sump and a finer pressure screen on the accessory case. The suction screen mostly stopped big chunks (the kind with part numbers on them), and the pressure screen wasn't nearly as efficient as a modern full-flow paper element, so a lot of fine debris just kept circulating until the oil was changed. Even so, with frequent flying, good maintenance, and 25-hour oil changes, those engines could still make TBO. They might not get a second run though without a lot of replacement parts because of significant wear.

Then full-flow, spin-on oil filters became common. Their pleated paper elements did a much better job of cleaning the oil and retaining contaminants than the old pressure screens, and engine wear rates dropped. That allowed oil change intervals to be extended to 50 hours when a full-flow filter was installed. Combined with the introduction of multigrade oils with modern anti-wear and detergent additives, engine parts tended to last longer, and second—sometimes even third—runs to TBO became realistically achievable.

		CHAMPION 45108-1	TEMPEST 48108-2	WIX 51515	K&P S-15	CHALLENGER 48108C
AVERAGE CUMULATIVE EFFICIENCY %	5µM	4	4	7	4	4
	10µM	10	8	24	3	3
	15µM	25	19	55	1	1
	20µM	43	30	78	<1	<1
	25µM	61	45	90	<1	<1
	30µM	83	68	97	<1	<1
	35µM	96	88	99	<1	<1
	40µM	99	95	99	<1	<1
Retained capacity in grams		25.6	17.9	22.4	3	3
Test time in minutes		110.1	81.6	99.9	14.8	14.3

Test results for five different spin on full flow oil filters showing filter average cumulative efficiency and retained capacity. For example the Champion filter captured 61% of the particles that were 25 microns or larger and 99% of the particles that were 40 microns or larger. The test was terminated when the differential pressure across the filter reached 10 psi above the clean filter pressure drop.

More recently, reusable full-flow oil filters using very fine stainless steel mesh screens have been developed to reduce the cost of oil changes and the waste stream from disposable filters. But can they really do as good a job of filtering the oil as the disposable paper-element versions? The manufacturers claim that their stainless steel filter mesh, often advertised as ‘22 microns,’ provides unmatched protection. Let’s look at some actual test results to see if that’s true.

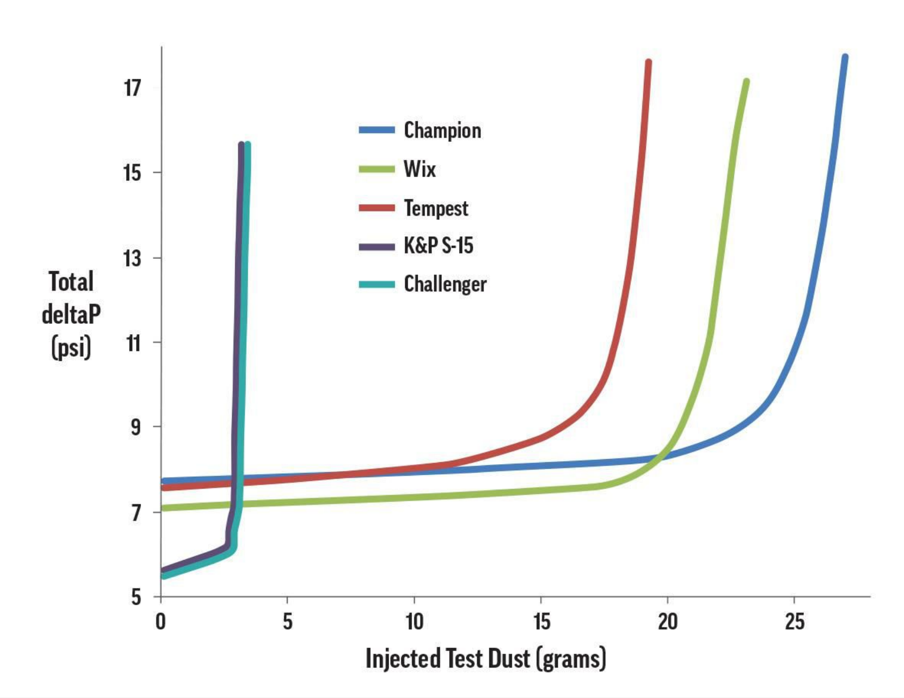
Dan Horton, a member of the Van’s Air Force, wrote an excellent article and had five spin-on oil filters tested using the ISO 4548-12 multi-pass procedure and compared the results to the SAE ARP-1400B standard for piston aircraft engines. Champion and Tempest disposable oil filters, commonly used on certified aircraft, were included, as well as a Wix automotive oil filter that some homebuilders use on experimental aircraft. Challenger and K&P reusable stainless-mesh filters rounded out the list.

SAE ARP-1400B requires a minimum filter efficiency of 75% at 25-micron particles and 90% at 40-micron particles. It also specifies a minimum contaminant holding capacity of 15 grams with no more than 8 psi pressure differential across the filter at that loading, and a minimum housing burst pressure of 500 psi.

Looking at the test report table on the previous page You’ll note that both the Champion and the Tempest filters exceeded the ARP-1400B requirement of 90% efficiency at 40-micron particles. Champion measured about 99% efficiency, and Tempest was 95%. By contrast, the reusable Challenger and K&P stainless-mesh filters were essentially ineffective in this size range, capturing **less than 1%** of 40-micron particles in the test.

Neither Champion nor Tempest met the ARP-1400B requirement of 75% efficiency at 25 microns—Champion averaged about 61%, and Tempest was 45%. Even so, both disposable filters performed **far better** than the Challenger and K&P units, which again showed **under 1% efficiency** at 25 microns.

This matters because the most destructive wear particles in engines are not the big chunks but the fine debris in the 2–22 micron range. That size coincides with typical oil-film thicknesses in bearings and gear contacts, so particles in that band wedge into the lubricating film and do the most abrasion. These fine particles are also what produce the familiar "fuzzy glob" on a magnetic chip detector or oil-screen magnet that is a visible indicator of the very small ferrous debris circulating in the oil.



A filter that fails to remove particles in the 20–40 micron region is almost certainly allowing large quantities of the even more damaging **2–22 micron wear particles** to circulate freely. Testing by GMC published in SAE paper #881825 indicated that engine wear can be reduced by up to 70% by going from a 40 micron filter to a 15 micron oil filter. The Champion and Tempest paper-element filters at least reduce that burden significantly, whereas the stainless-mesh filters on the Challenger and K&P oil filters offer virtually no meaningful protection in precisely the particle sizes that matter most for long-term engine wear.

Another area of performance to be considered is the pressure drop across the filter and how much capacity it has to capture and hold contaminants. This is important because once the bypass valve in the filter opens unfiltered oil is free to flow around the filter media. ARP-1400B sets the bar at a capacity of at least 15 grams before a differential pressure of 8 psi across the bypass is reached. The Champion and Wix easily exceeded the ARP-1400B specification of 15 grams, while the Tempest fell slightly short of it with about 13 grams. The Challenger and K&P fell far short of it only managing about 3 grams each even though their starting differential pressure was lower than the other filters. This illustrates one of the real shortcomings of wire mesh filter elements and that is that they clog easily. A paper element filter uses a graded density depth media to separate and store particulates. Its fiber matrix provides **many tortuous flow paths**, allowing it to trap particles of different sizes throughout the thickness of the media rather than just on its surface. A stainless-mesh element acts like a **sieve**, blocking only particles larger than its pore size. Once those openings fill, flow is forced through fewer and fewer holes, causing a rapid increase in pressure drop. A metal mesh filter requires considerably more surface area than a paper element filter to match the capacity of a paper element and this is not the case in the Challenger or K&P reusable filters.

What about the Wix automotive filter, it beat both Champion and Tempest in filtering efficiency across the board? I guess that is a testament to how good some automotive filters have become. However there a few other things to consider with regard to the Wix filter. First, it is not certified for use on aircraft. Second, it has a housing burst pressure of only 290 psi and does not meet the 500 psi minimum specified in SAE ARP-1400B. This could be an issue if you are using a single viscosity 50 weight oil and trying to start a cold engine with cold oil on a winter day. In addition it does not have a hex nut on the end for torquing the filter to spec nor a hole to run a safety wire through. It is only included in the testing for comparison to oil filters certified for aircraft use and perhaps to set an aspirational goal for Champion and Tempest to shoot for.

As far as environmental impact goes, assuming you are discarding a similar amount of used oil from either a disposable or a reusable filter, the waste streams differ mainly in solid materials versus cleaning byproducts. With a disposable filter, you are throwing away the steel can, the trapped magnet, and the oil-soaked paper element. With a reusable filter, the recurring waste is instead the cleaning solvent and the coffee filter used to capture the particulate removed during cleaning for inspection. Overall, the reusable filter generates a significantly lower solid-waste stream, and its environmental impact can be quite small, especially if you use a biodegradable cleaning solvent sparingly and dispose of the rinse waste properly.

That said, while reusable stainless-mesh filters are certainly far better than the old pressure screens used on earlier aircraft engines, they do not filter nearly

It can be difficult to visualize the size of particles we are talking about. A 40 micron particle is about half the size of a grain of sand and is barely visible with the naked eye. A 15 micron particle is the size of a grain of pollen. Dust particles range in size from 2 to 100 microns. Particles less than 5 microns will remain suspended in the air indefinitely unless they are removed using a HEPA filtering system. Bacteria are around 2 microns in size and the Coronavirus is one tenth that size or about 0.25 microns in size. See the illustration for a comparison of the relative size of particles.

as well as modern disposable paper-element aviation filters. Reusable filters can be "good enough" for piston engines only if they are cleaned very frequently during oil changes, typically every 25 hours or less, to keep contamination levels low. As for me, I'll be sticking with paper filters and will change them every 50 hours because I prefer the higher filtration efficiency and spending less time changing oil and cleaning filters and more time flying. I think I will also try dropping off the used filters at AutoZone to take advantage of their free recycling program. When my case of Tempest filters are used up I'll start using Champion filters because their filtration efficiency is higher. 😊

Will Fox is a flight instructor and homebuilder. He also serves as a Technical Counselor and Flight Advisor for the EAA. In his spare time he enjoys working on and flying his two homebuilt aircraft, a Pegazair P-180 and a Questair Venture. He is also fascinated with solar power and electric vehicles, so his next airplane will be electric. Please feel free to contact him at tailspinfox@gmail.com if you have questions or comments.

Dragonfly Project Update

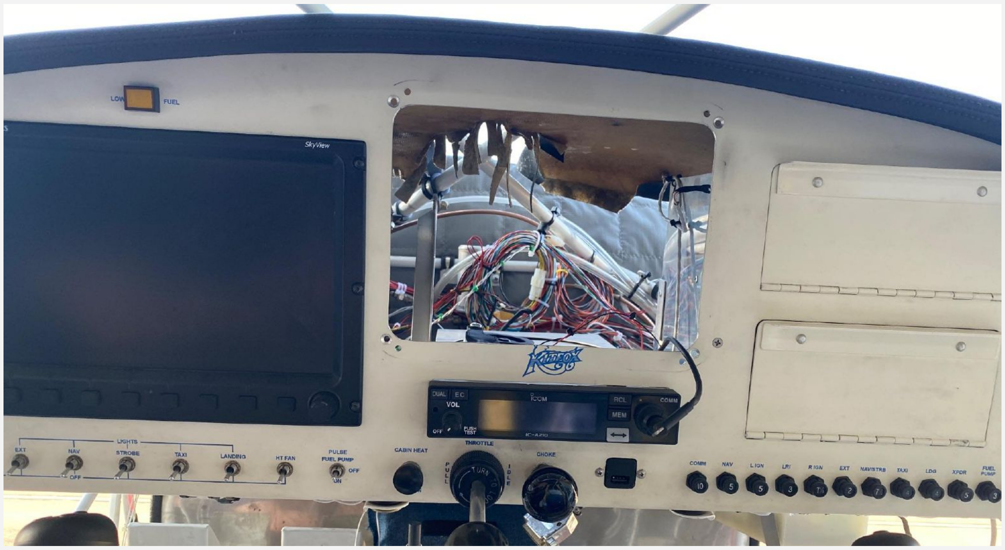
Stay tuned here. I'll have some updates on the brakes, wheels, fairings, new firewall forward, and new panel and instruments in the following months. We haven't stopped working but with the holidays and cold weather we have slowed down a bit.

Editors Log: Kitfox N39RW

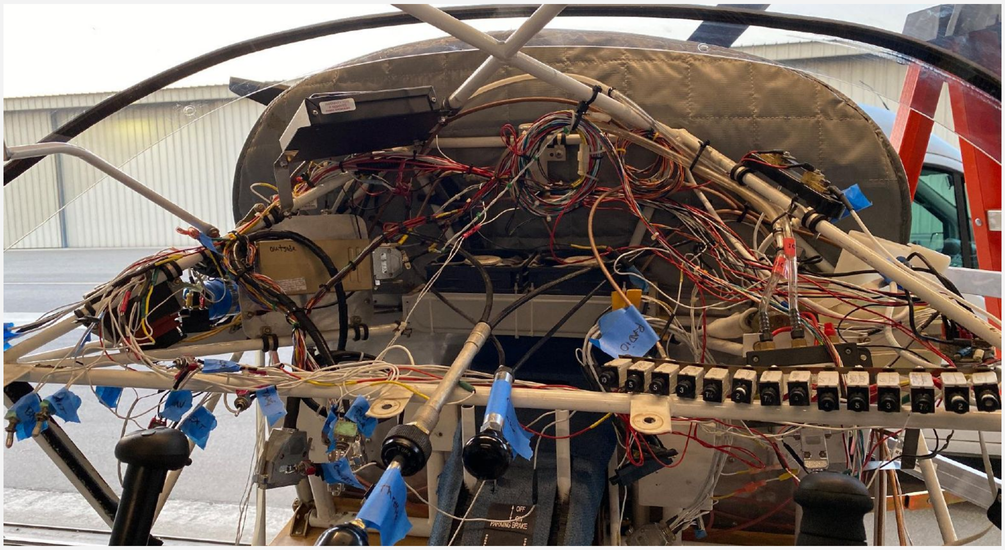
by Andrew DeVecchio

As I'm just getting back into the groove on this project, I'll start with the back story, mostly through photos and I'll make it brief. I'm hoping by next month I'll have a bit more to add as far as tasks go. I'll have to break out the heaters and jumpsuit as I get started though, not ideal.

N39RW out on a socal dirt strip



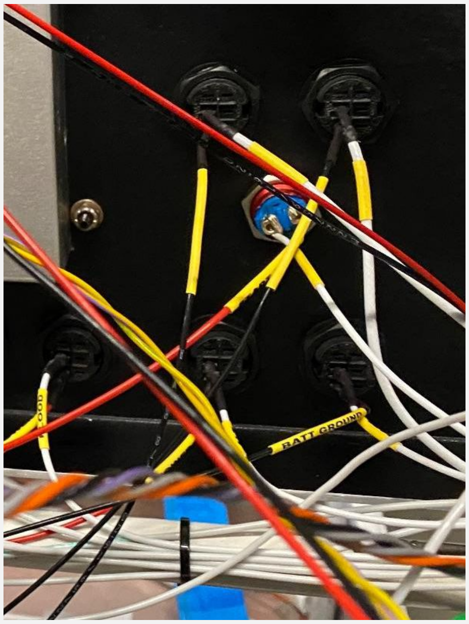
I was bad at taking progress photos, but here's one of what the panel looked like before



...and a tear down. wiring on this wasn't the best

and full rebuild. I kept the original Dynon system and added a few components. I mostly just wanted to clean it up as the previous owner hacked in an ipad before. On the right is my setup for the ipad with some 3D printed mount that fits over the glove box (snack box?)

new bracket for headset audio



everything's clearly labeled. Neurotic, well yeah but makes for an easy repair someday

theres plenty more to the story but in Febuary 2024, Jen and I trailered the Kitfox from CA to Santa Fe

here it is on our land out in 29 Palms. I had always hoped to fly it here first but life had other plans

and here she sits waiting to shake the dust off and get flying again, panels removed, jobs started and left unfinished

Catching Up

by ChatGPT / Andrew DeVecchio

When flying from a high-pressure area to a low-pressure area, and you do not reset your altimeter, what will happen to your indicated altitude?

A) It will read lower than your actual altitude
B) It will read higher than your actual altitude
C) It will remain accurate as long as the temperature is standard

Pilot Wisdom: "High to Low, Look Out Below"

It's one of those sayings we all memorized early on, then promptly forgot somewhere between checkrides and real life. When pressure drops and you haven't reset the altimeter, your altimeter thinks you're higher than you are. Terrain and antennas don't care about that little oversight.

Even if you're flying VFR and the world looks fine out the window, make it a habit: **every new weather source, every new ATIS, every big pressure gradient—twist the knob.** It's the cheapest safety upgrade in the cockpit.

EAA Chapter 691 Membership Application/ Renewal Form

We have a very generous one to one matching donation from Pamela Herbst and John Powell of $500. As you consider your year end giving, consider EAA Chapter 691. The first five hundred dollars of donation will be doubled and you will be eligible for a tax deduction to the extent allowed by law up to the amount you donated.

I am sending you this in the hopes of getting it to you before the barrage of other donation requests that the end of year brings and catching you while you are feeling generous. Please note that if you have not yet paid your 2025 duesnation, that will count as a donation and be doubled as will anything you add on top of the $35.

If you read the newsletter, and/or attend the meetings you are aware of the incredible increase in projects and community involvement that your EAA Chapter has been involved in, in the last few years. So do what you can and your effort will be doubled. You can send or hand your check, made out to EAA Chapter 691, to me or Will Fox at any of our meetings or send it to:

David Young,
819 Gonzales Rd,
Santa Fe, NM 87501.

David Young
Treasurer of EAA Chapter 691

EAA Chapter 691 Membership Application/ Renewal Form

Please consider making a donation to our 501c(3) non-profit by mailing this form along with $35 to our Chapter Treasurer, Checks can be made out to <u>EAA Chapter 691</u>:

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:

www.eaachapter691.org