SPORT Aerobatics

NOVEMBER 2020

OFFICIAL MAGAZINE OF THE INTERNATIONAL AEROBATIC CLUB

Prepared for Fun!

- LEARN TO TAKE OFF AND LAND A PITTS
- BEN LOWELL AERIAL CONFRONTATION

Preproduction, computer-generated image shown. Available late 2020. Always consult the owner's manual before off-road driving, know your terrain and trail difficulty, and use appropriate safety gear.

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Vol. 49 No. 11 / **NOVEMBER 2020** *A PUBLICATION OF THE INTERNATIONAL AEROBATIC CLUB*

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ON THE COVER: David Chiarcos, IAC 440719, flies his beautiful Pitts Special S-1S. Photo by Pat Hanna.

ABOVE: Alain Aguayo, IAC 435356, flying his Giles G202, practices at Union City, Tennessee, with members of the U.S. Advanced Team. Photo by Colleen Cates.

SPORT Aerobatics
OFFICIAL MAGAZINE OF THE INTERNATIONAL AEROBATIC CLUB

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Change of address, lost or damaged magazines, back issues.
EAA-IAC Membership Services
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Supporting IAC Through Donations and Volunteerism

BY JIM BOURKE, IAC 434151

RECENTLY TWO ENTHUSIASTIC IACERS, Bruce Mamont and Mike Ciliberti, took it on themselves to encourage members to donate to the IAC by posting fundraising campaign information on the internet. That sort of initiative and caring is much appreciated, so my thanks to them. Following their lead, I'd like to take a moment to share a high-level view of our financial picture and tell you how you can help.

It's surely no surprise that the abbreviated 2020 season has hit the aerobatic community hard. While in a normal year we have 30 to 40 contests from which we draw revenue, so far this year we have held only five. The cancellation of EAA AirVenture Oshkosh and the U.S. National Aerobatic Championships are big blows to our revenue picture as well because we use these events for merchandise sales, to drive donations, and to gain new members.

It may surprise some to learn that dues alone do not cover our expenses. Our budget each year is a bit over $400,000. If you do the math, assuming we have 4,000 members, you will see we spend about $100 per member. Obviously, this is a lot more than the $45 in dues we collect from each of you. The dues cover the magazine and a bit of overhead, and the rest of our budget is paid for with event activity.

WE ARE STILL MUCH BETTER OFF THAN MANY NONPROFIT ORGANIZATIONS.

Our treasurer, Jordan Ashley, recently reported that we will be taking a loss by the end of the year of around $100,000. To take care of our bills we will be moving around $150,000 of our investments to our expense account, leaving us with about $350,000 in CDs.

If you are following the numbers, you will see that we will have a little less than 12 months of expenses in reserve now. We are still much better off than many nonprofit organizations, but of course we do need to start collecting funds to replenish our losses. And this whole situation is very disruptive to the financial goals we've set in recent years, such as to provide endowments to provide much-needed funding for aerobatic scholarships and our teams. Also, there is way more work we could be doing if we had an additional full-time staff member to help out or a marketing budget that allowed us to reengage with the public.

I understand that things are rough all over, and I'm not asking anyone to give who is already financially stretched by the pandemic lockdowns, but if you are able to give, please go to IAC.org and click the "Give" button we've recently added. If half of our members donated just $50, we would take care of this year's shortfall. This is less than the cost of one hour of aerobatic flight!

Another way you can help out is by volunteering. Our volunteers keep the IAC going every contest weekend, but we need help at IAC headquarters as well. Volunteers are working hard to update all of the IAC's offerings, including the *IAC Policy and Procedure Manual*, the contest director's packet, and the website. For these tasks we need volunteers who have skills and a willingness to dig in. See me if you have the capacity to take on a task or two.

Before I wrap up, a couple of quick notes. The U.S. Advanced Aerobatic Team is getting some good practice in this year under the formidable eye of team coach Rob Holland and team manager Mike Heuer. I've heard very good things about how this is going, and I am so excited to see what they can do. Make sure you give the team members your support! Being on a team is an expensive, rigorous, and sometimes lonely endeavor. A pat on the back goes a long way. We have no goal in world competition but *absolute victory*. I love the people of France, I really do, but if I never hear their anthem again at a world competition, I will be the happiest man on the planet. We are behind you, team!

I am always reachable at president@iac.org. IAC

▸ Please send your comments, questions, or suggestions to president@iac.org.

PHOTOGRAPHY BY **CHRIS BECERRA, ALTEZA FILMS**

Preparation

BY LORRIE PENNER, IAC 431036

"THERE IS SO MUCH MIND SHARE BEING PAID TO THE CHALLENGING TASK OF HONING COMPLEX SKILLS IN A DEMANDING ENVIRONMENT THAT IT CAN BE EASY TO FORGET ONE OR MORE OF THE MANY ROUTINE DETAILS THAT ARE CRITICAL TO FLIGHT SAFETY."

— TOM MYERS

ARE YOU A GAMER? Do you like dice, board games, or cards? When my mom and I went into the initial lockdown in our state due to COVID-19, we were playing only one card game. Well, after weeks of being shut in we finally had to branch out. Enter Qwirkle! Although on the outside of the box the game looked simple, we had to read and reread the directions multiple times. There was quite a bit of strategy involved. There was no way to simply pick up the game and play. Reading the directions prepped us, and in no time, we were mildly obsessed with the game.

Preparation is the key word in this month's issue of *Sport Aerobatics*. In our local IAC chapter, we have some enthusiastic members who are interested in getting an aerobatic practice area (APA) approved. Bruce Ballew's article about doing the paperwork for an APA is very timely to our efforts. In it, Bruce leads us through what it takes to work through the preparation and submittal of the necessary forms required by the FAA to get the Certificate of Waiver for an APA. It includes very helpful information and is a must-read for anyone considering filing out the 7711-2 (Application for Certificate of Waiver or Authorization) and the Environmental Information Document (EID).

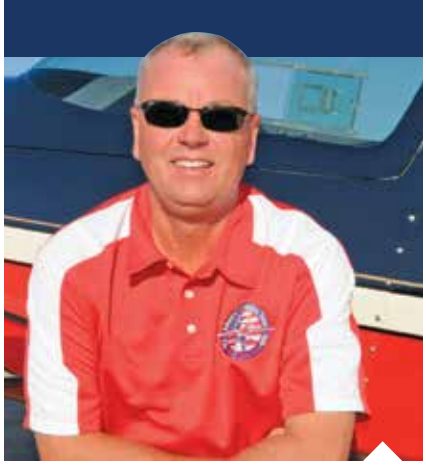
In Andrea McGilvray's article, "Learning to Take Off and Land With Budd Davisson," she leads us through all the mental preparation it took to succeed in her mission. Budd had told her, "I can teach anyone to land a Pitts," and Andrea simply said to herself, "I am anyone." After the first two days, scared and frustrated, she took pause, closed her eyes, and visualized each takeoff and landing, repeatedly gathering all input from Budd's tutelage.

From early in our flight training we are taken through checklists and made to memorize a few acronyms. Tom Myers adds one more for us — the stupid check. A final set of checks that he makes just before climbing into his airplane. For Tom, that almost always means for an aerobatic flight. For aerobatics, he said, "There is so much mind share being paid to the challenging task of honing complex skills in a demanding environment that it can be easy to forget one or more of the many routine details that are critical to flight safety."

Most endeavors typically start with some form of preparation, whether you are learning a new game or starting a new flight discipline. The same goes for creating new programs or planning a contest. I would like to echo Jim's call to volunteers in his President's Page. There are many moving parts behind the scenes at IAC headquarters that could benefit from your involvement. One of my volunteer gigs for IAC is supplying materials to post to IAC social media. Working on developing posts and getting permission for sharing is actually quite fun, and I really enjoy the conversations I get into with our members. Thank you to those of you who have already contributed your photos! Please keep tagging us: #IAC_HQ. While fun, it is also somewhat time-consuming, and I need some help. So, if you like social media and don't mind reaching out to your fellow IAC members for information and permission to share their posts, drop me an email. IAC

SUBMISSIONS: Photos, articles, news, and letters to the editor intended for publication should be emailed to editor@iac.org. Please include your IAC number, city, and state/country. Letters should be concise, polite, and to the point. All letters are subject to editing for clarity and length.

Aerobatic Practice Area Waiver – Fill Out the Paperwork



BY BRUCE BALLEW, IAC 26969, GOVERNMENT RELATIONS CHAIR

THIS ARTICLE IS THE FOLLOW-UP to one that was published in the July 2020 *Sport Aerobatics* issue. The July issue discussed ideas and issues related to the selection of an aerobatic practice area (APA) site. This article will provide guidance related to the preparation and submittal of the necessary forms required by the FAA to get the certificate of waiver (CoW) for your APA.

Two forms must be completed and submitted to the FSDO — the 7711-2 (Certificate of Waiver or Authorization Application) and the Environmental Information Document (EID). It would be helpful for you to review 8900.1, Volume 3, Chapter 5 (Issue a Certificate of Waiver for an Aerobatic Practice Area or an Aerobatic Contest Box) about the guidance that the flight standards district office (FSDO) will be using to issue your CoW. Chapter 5 is not too long and will help you understand the process better. There are links to these documents on the International Aerobatic Club website under "Programs > Govt Liaison > Waivers."

Many FSDO inspectors confuse an APA or aerobatic contest box (ACB) with an air show, which it is most definitely not. Air show CoWs (including air races, certain parachute demonstrations, balloon meets, and competitions conducted before an invited assembly of persons, e.g., Red Bull races) are addressed in 8900.1, Volume 3, Chapter 6 (Issue a Certificate of Waiver or Authorization for an Aviation Event) and have more onerous requirements. Be on the lookout for your FSDO inadvertently inserting Chapter 6 (air show) requirements into your APA CoW.

Most FSDOs do not process many applications for APAs or ACBs and may not be completely familiar with the process, so be patient. The FAA has made great progress in the last few years by incorporating APA/ACB CoW training as part of the required training for aviation safety inspectors (ASIs). Also, the FAA has four aviation events specialists who are a great resource for the IAC and the FSDOs and are folks I regularly talk with. They are the subject matter experts at the FAA for our APAs. You can always politely request that the inspector contact one of these specialists with any questions about the process.

It is worth your time to call the FSDO and ask to speak with someone about your plans to apply for an APA. Hopefully, you can speak with the person who will actually process your application. This step gives you a chance to ask any questions and establish a relationship with your FSDO ASI. It also gives the ASI a heads-up that your application is on its way.

The whole purpose of requesting an APA CoW is that you want to waiver certain FARs that would otherwise preclude you performing aerobatics where you want. Below is a list of commonly waived FARs:

- 91.117(b)(c) Aircraft speed
- 91.119(c) Minimum safe altitudes
- 91.121 Altimeter settings
- 91.127 Operating on or in the vicinity of an airport in Class E airspace
- 91.129 Operations in Class D airspace
- 91.130 Operations in Class C airspace
- 91.131 Operations in Class B airspace
- 91.155 Basic VFR weather minimums
- 91.303(c)(d)(e)(f) Aerobatic flight

7711-2 APPLICATION FOR CERTIFICATE OF WAIVER OR AUTHORIZATION

The 7711-2 form is available online at the FAA site in a fillable form and on the IAC website via a link. The 7711-2 is used for APAs, ACBs, and other aviation events like air shows. Only sections 1 through 10 and Section 17 are required to be completed for an APA.

BE A GOOD NEIGHBOR, MAKE FRIENDS, RESPECT THE OTHER STAKEHOLDERS, AND DON'T ABUSE THE AIRSPACE JUST BECAUSE YOU CAN.

- Item 1, Name of Organization. If you are requesting the APA on behalf of a club or chapter, put the name of the club or chapter in this section; otherwise, leave it blank.

- Item 2, Name of Responsible Person. As the name suggests, put the name of the person who will be responsible for administering the APA. This is the person who will be named on the CoW and will be the person who the FAA contacts if it has any questions relating to the APA before or after issuance of the CoW. The responsible person has the obligation to assure that all the conditions of the waiver are complied with. (Note: Others may be authorized to activate and deactivate the APA. Do not include their names here. This topic is discussed later in this article.)

- Item 3, Permanent Mailing Address. Insert the mailing address of the Responsible Person.

- Item 4, State whether the applicant or any of its principal officers/owners has an application for waiver pending at any other office of the FAA. I have never seen a case where this has anything but a "not applicable" (NA) in it. However, if you do have another application pending at another FSDO, insert that here.

- Item 5, State whether the applicant or any of its principal officers/owners has ever had its application denied, or whether the FAA has ever withdrawn a waiver from the applicant or any of its principal officers/owners. This item usually gets an NA, but if it is applicable to your situation, state so.

- Item 6, FAR section and number to be waived. Insert the complete FAR(s) that you are requesting in this section, e.g., 91.303(c)(d) or 91.119(a)(b). Do not simply put 91.303 or 91.119.

- Item 7, Detailed description of proposed operation. I recommend that APA applicants put "Aerobatic practice area (APA) for the purpose of developing and maintaining proficiency in aerobatic flight." Don't just put "APA."

- Item 8, Area of Operation (Location, Altitudes, etc.). Hopefully, you have decided to make your APA a circle centered on the airport or some landmark versus a box of some sort. Reference a Google Earth graphic and sectional chart attachment that you have made that shows the proposed APA. State the location and the altitude of the proposed APA. Example: *Area depicted in the attached aerial picture but generally encompasses an area within 1 nm radius of the KXXX airport (latitude/longitude) from the surface to 5,000 feet MSL.*

- Item 9a and 9b, Beginning (Date and Hour), Ending (Date and Hour). For the beginning date, insert your best guess as to the date and time you would like the CoW to be issued. As for the ending date, APAs are usually issued for a three-year term, so insert the date and time that is three years from the beginning date. A common error is that an applicant puts a beginning date of 04/01/2020 at 00:01:00 and an ending date of 04/01/2023 at 23:59:00. That is three years and one day. The dates should read 04/01/2020 to 03/31/2023.

- Item 10a through 10d, Aircraft and Pilot Information. I suggest that you put the aircraft that will be representative of the aircraft that will be using the APA. For example, write a Pitts, an Extra, a Decathlon, and a Christen Eagle if these are representative of your situation. Also, put a pilot name, certificate number/rating, and home address for each of these. I recommend that you include the statement "Other unnamed aircraft and pilots" on a blank line in this section. The section does not limit the aircraft type and pilots that can use the APA but is intended to give the FSDO and environmental folks an idea of the kind of aircraft that will be using the APA. If you think there is a possibility a radial engine-equipped or jet aircraft will use the APA, you should include it in this section.

- Items 11 through 16. These sections are not applicable to an APA. I usually put NA in each of these places. At the top of Page 2 of the 7711-2, it specifically states that "Items 11 through 16 to be filled out for Air Show/Air Race Waiver Requests Only." Many FSDOs miss this statement and ask that you complete this section. Don't do it. It's explicitly not required, provides no value added, and sets an unfavorable precedent.

- Item 17, Certification. The Responsible Person should sign and date the form.

- Remarks. If you choose to permit other people to activate or deactivate the APA, they must be named here by name only. Their names will be listed in the CoW. Note of caution: As the Responsible Person, you are responsible for complying with all of the requirements of the CoW and its special provisions (SPs).

If you choose to allow others to activate and deactivate the APA, you are responsible for making sure they are briefed, and you accept the requirements of the CoW and the SPs. Specifically, they are required to 1) brief all the pilots who will be using the APA on that day, 2) assure the pilots using the APA complete the Use Log and 3) assure that all pilots comply with the requirements in the CoW and SPs. If they screw up, you get the phone call from the FAA and will have to explain their actions. When you submit your application package, it is worth putting in your cover letter that you have included the names of the people authorized to activate or deactivate the APA in the Remarks section on Page 2 of the 7711-2. This section is often overlooked by the FSDO. It's a real bummer to get your fancy new CoW only to find that your buddies were not included in the CoW, and you have to go through some hassles to get them officially added to the CoW.

ENVIRONMENTAL INFORMATION DOCUMENT (EID)

This form is available online at the FAA's website, or you can Google the words "Environmental Information Document for Proposed Aerobatic Practice Area."

This document is only required for a long-term APA and is not required for a short-term (less than 10 days) APA or an ACB. The FAA's environmental folks really do a great job. Section 1, 1 through 4, is the same as that presented in the 7711-2 and should be restated here.

- Section 1, 5, Proposed Day(s) and Time(s) of Operation. Use your best estimate of when you will be using the APA. You are not strictly bound by the days and times that you put here, but make a good faith estimate of what you think.

- Section 1, 6, Aerobatic Practice Area (APA) Use and Flight Duration. Again, use your best estimate here, and you are not strictly bound by what is presented here. Note: Remember that columns 2 and 3 ask for how much actual flying that you are forecasting, *not* how long was the APA activated. Example: If you activate your APA for four hours on a given day, you fly two flights of 15 minutes each on each day, and you do these things three times per month, you would put 3 in Column 1, 30 minutes in Column 2, and 90 minutes in Column 3. Use your best estimate on the seasonal distribution (columns 4 through 7).

- Section 1, 7, Aircraft Information. Put your best estimate of the aircraft make and model representing the aircraft that will use the APA, the type flight (Primary, Sportsman, Intermediate, Advanced, Unlimited, or air show routine), and the number of times per month. Once again, you are not strictly held to the precise numbers you put here, but they should be credible.

- Section 1, 8, Description of land use and structures underlying and within 1/4 mile of the APA boundary. This section will normally include airport, industrial, agricultural, or residential property.

- Section 2, 1, Background of APA:

  - (a) Select the appropriate box for a new APA or an APA renewal.

  - (b) If it is a renewal, complete items i, ii, and iii.

- Section 2, 2, Environmental Issues. Note that this section only applies to noise or environmental complaints related to a previous APA operation and not "normal" airport noise complaints. For a new APA application, this section would not be applicable, and you should place an NA here.

- Section 2, 3, Public Involvement. This section is where you identify any efforts or discussions you have had with the airport management and other stakeholders.

That's it for the EID.

The FAA folks that handle the EID have certain notification requirements that take time, approximately four to five weeks, and there is no wiggle room here. The result of the EID folks' work is that the FSDO will receive a categorical exclusion (CATEX) from the FAA environmental folks stating that no further environmental review is required. The EID and 7711-2 processing occur in parallel, not in series. Therefore, the sooner the FSDO can forward it, the better. Many times, the FSDO will hold off forwarding the EID until other CoW issues are resolved. If this happens, politely request that the EID portion of the submittal be submitted. But actually, it shouldn't be necessary; it delays the process and should be avoided. It's best to get the EID clock started as soon as possible. Receipt of the CATEX by the FSDO does not commit the FSDO to issue a CoW. Additionally, if there were an environmental issue that would be rare and unlikely, it's better to learn about it early in the process.

I GUESS IT'S A SIGN OF THE TIMES, BUT PEOPLE ARE BECOMING MORE SENSITIVE TO NOISE AND THE PERCEIVED "UNSAFENESS" OF AEROBATICS. IF THE AIRPORT OR FSDO HAD ANY CONCERNS, AFTER A LITTLE TIME USING THE APA, MOST — IF NOT ALL — LEARN THAT THEIR CONCERNS ARE NOT REALLY ISSUES AT ALL.

SPECIAL PROVISIONS

All CoWs are accompanied by a list of standard-approved SPs. These provide details about activation and notification requirements, record-keeping, weather minimums, etc. If the FSDO ASI believes it is appropriate to deviate from the standard SPs and add a nonstandard SP, the ASI must receive the approval from the regional or national aviation events specialist. These are usually done to address site-specific issues and are not very common.

SUBMITTING THE PACKAGE

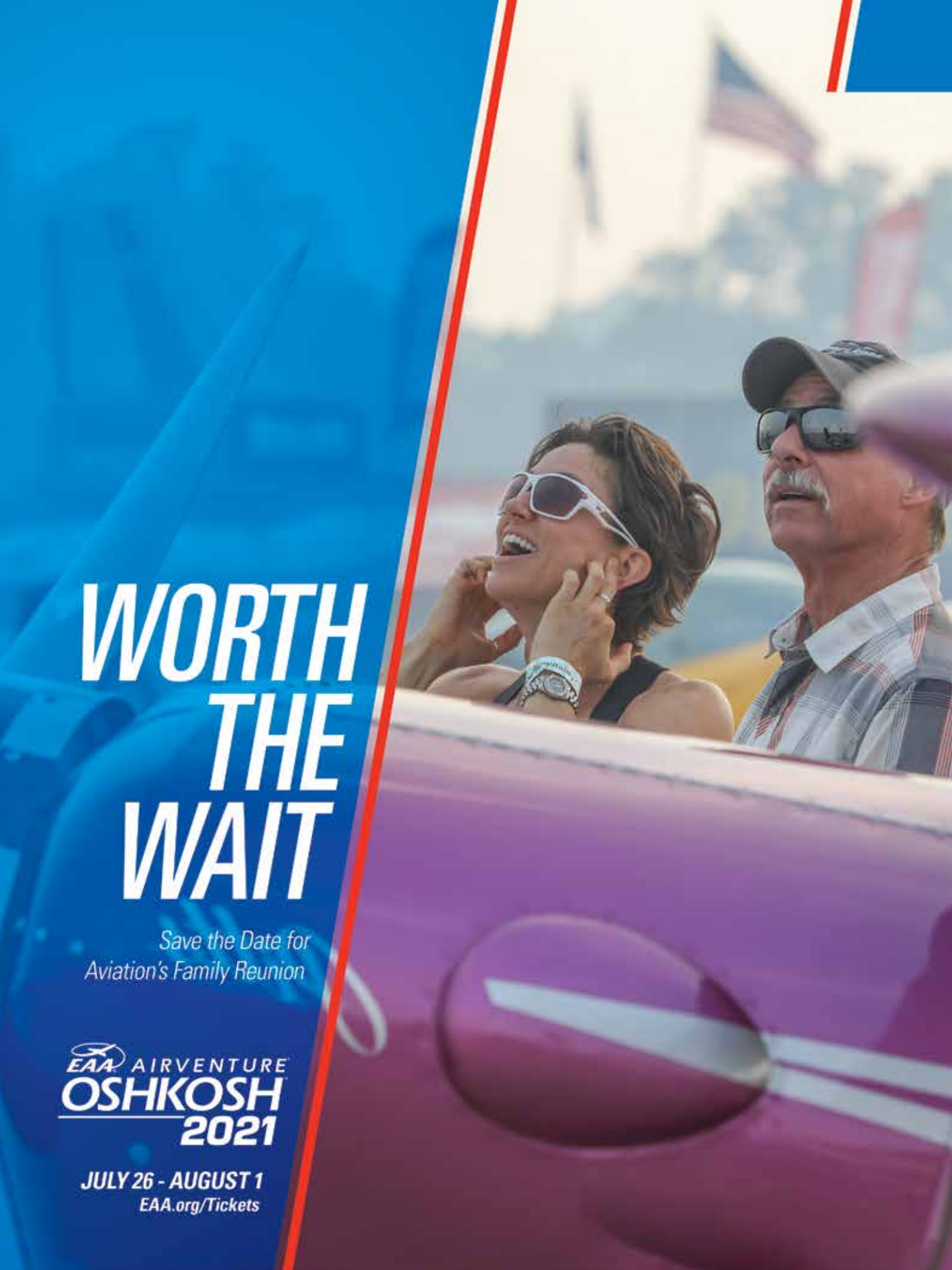
When the paperwork and coordination is done, it's time to submit the package to the FSDO. You are required to submit three copies of the package to the FSDO for its use. Some FSDOs are okay with submitting it via email, but I believe it's best to do it through a hard copy sent via the U.S. Postal Service, FedEx, or UPS, or to hand-deliver it if you can. Prepare a cover letter that identifies any special circumstances that may apply to your situation. Specifically, mention that there are other people who can activate the APA who are identified in the Remarks section on the 7711-2 and reference any coordination with ATC or the airport management.

Hopefully, you have already spoken with the FSDO, can get a specific name of the ASI who will be handling your application, and can address the submittal to that person. Follow up to make sure the ASI received it. I mentioned earlier in this article that you should be politely persistent. That advice applies here, too. FSDOs have a lot on their plate these days, and it's easy for your materials to get buried and forgotten in their inboxes.

The ASI will get the process going. This part is where your coordination efforts should pay off. The ASI will contact the airport manager to make him or her aware of the application. Hopefully, the airport manager remembers your discussion and does not voice any objections. A lot of FSDOs are requesting a letter or email from the airport manager stating the manager has no objections, so if you can get it beforehand and include it with your submittal, you'll make it easier for the ASI. The ASI also will reach out to ATC to see if it has any concerns and is required to get, in writing, a statement from ATC that it has "coordinated." ATC does not approve APAs. Hopefully, you have identified any concerns that ATC may have and mitigated them. The ASI will forward the EID to the FAA's environmental folks for their action. Again, there is no reason to delay forwarding it to the environmental folks even if there are there issues related to the APA that must be resolved.

The FSDO should contact you if it has any questions, but stay in contact with the FSDO if you sense any undue delays; be politely persistent. After the ASI finishes and the environmental folks do their thing, the ASI will prepare the 7711-1 CoW with the associated special provisions and submit it to the FSDO manager for a signature. You'll get a copy, and away you go.

Read everything in the CoW and SPs and be prepared to comply with them. Clarify any questions you may have and then go fly. That's it. Be a good neighbor, make friends, respect the other stakeholders, and don't abuse the airspace just because you can. It will pay off in the long run. I guess it's a sign of the times, but people are becoming more sensitive to noise and the perceived "unsafeness" of aerobatics. If the airport or FSDO had any concerns, after a little time using the APA, most — if not all — learn that their concerns are not really issues at all. IAC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LEARNING TO TAKE OFF AND LAND WITH Budd Davisson

Flying with legends

BY ANDREA MCGILVRAY, IAC 440477

WHEN I SAW A PITTS SPECIAL for the first time some 30 years ago at an air show, I was enamored and fell in love. My first ride in a 1942 Stearman took my heart and gave it the love of aerobatics in a biplane. I had no idea that doing aerobatics in my own airplane would ever become a reality — or that I would fly a Pitts. Well, that thought would be as foreign as flying to space. Chances were slim at best that either would happen. However, aviation provides the opportunities that can happen with good timing and also provides what most people call luck.

After one of our EAA meetings back in 2016, Phil Vaneau, our Young Eagles coordinator, mentioned he had received some dual instruction in a Pitts S-2B. I asked for the name and number of the instructor, and as I was driving out of the parking lot, I was on the phone with Bryan Butler. My first Pitts flight happened almost three-and-a-half years ago in that S-2B — wow, how time flies. For those first three flights, I felt like I was the proverbial deer in headlights. Holy cow, the flights were amazing, and it all happened fast. But what fun!

After these three flights, I had to learn how to fly a Pitts. It became a mission, and the ad that Budd Davisson has — "I can teach anyone to land a Pitts" — was me. I am an anyone. So that is how my Pitts adventure flying dual with Budd Davisson in his Pitts S-2A in April of 2019 became a reality. The objective was to learn takeoffs and landings and try to perform them consistently. I wasn't just out joyriding; I wanted to master this so-called monster!

PHOTOGRAPHY COURTESY OF **BUDD DAVISSON**

Andrea's Hatz sits alongside two Pittses waiting on the ramp in the Texas sun.

Objective number one was how to fly a Pitts and make it do what you want it to do. Budd assured me that a Pitts will do what you want and only what you want. It will continue what you ask it to do until you ask it to do something else. That's the secret! The truth is that when you don't know what to do, well ... it is where you will find yourself in a pile of the smelly stuff.

Another thing Budd pointed out which sits well with me is that the Pitts is who you are. Your personality comes out and has a huge role in the way you fly it. That being the case, at that time I still needed to figure out my personality.

I learned that in the Pitts, with power on, there is a lot of right rudder needed. And with the power off, there is a lot of left rudder needed. Everything in between is a two-finger stick and rudder, sweet as cream, smooth as silk in a sleek aerial hot rod.

Since my goal was to fly an S-1 (S or C), all my lessons were in the front seat where you cannot see much of anything. Flying from the front gave me the sight picture that I would have for S-1 takeoffs and landings. Looking at the small triangles, formed by the struts between upper and lower wings, on the left and right side of the nose, I found there are only small parts of the runway to be seen. I learned that when the sides of the runway move or change size, you better fix it quick!

My first lesson was to learn to feel my rear end, that soft and squishy thing I sit on and take for granted. I thought I had some feeling in it, but I guess it is way too soft. So we worked on the fascinating yawing of the Pitts: power on, right rudder, power off, left rudder, and back and forth; both straight and climbing/descending turns.

Budd did the initial takeoffs and handed the controls over to me at 50 feet. Next we did "bump and goes." Touch and goes are a lot different; these are neither intending nor wanting to land. Just bump the ground one time, full power, and nose up and go.

Then the dreaded, scary high-speed taxiing. Don't do this at home! It's neither safe nor easy, but it's mandatory on learning not to overcorrect and getting the feel of the airplane on the rollout. The airplane is not wanting to do anything except go straight until an input happens. Even though going straight sounds easy, it is hard not to overcorrect. Small, quick inputs are better than big, long inputs — much easier said than done. There's no dancing on the rudders, and keep your toes off the brakes!

On the second day, Budd let me do the takeoffs, which made me excited. How hard could it be? My first attempt gave me great pause. First of all, it was nothing like the Hatz biplane, nor what I remembered in the S-2B a few years ago, and on that occasion, I am sure the instructor helped me. Budd's Pitts S-2A was nothing like any other tailwheel airplane I had ever been in. Budd said that if he was going to lose the airplane to a crash, it would be on takeoff, not a landing, and I almost proved that point on my first and second unassisted takeoffs. As I gave it power, Budd said, "Rudder," then repeated that until he was screaming repeatedly to me, "Rudder, rudder, rudder!" And he finally helped me get straightened out. On the second takeoff, I used more rudder but let some weight off the tail, and it darted to the left; Budd had to come to the rescue again.

Scared and frustrated that we almost wrecked the first two times, I was ready the third time, and by golly, I was not going to let it go to the left. Well, I either overdid it or we had a gust, but all in all, we were off the ground. I found myself holding my breath. But it is a better idea to breathe so when you are off the ground you can think again.

At first light the next day, my head started to spin, thinking of the previous day's flights. Keeping my eyes closed, I went over and over each takeoff and landing. In my mind, I hit "rewind" and "play" repeatedly until I felt exhausted. But this day would be a better day. I was ready for the world; I hoped it was ready for me!

Andrea's Hatz, a much tamer mount after training in the Pitts S-2A.

The fourth through seventh takeoffs were much better, and I refused to let the airplane go right. The last takeoff of the day was pretty good. I learned a lot about how to take off in Budd's Pitts S-2A. Get yourself straight on the runway, sit back, head up out of the cockpit "hole" like a gopher, and add full power smoothly but quickly. Within one and a half seconds (I began to feel the tail fly with practice), remove the weight off the tail wheel only, and feel the pressure of the horizontal stabilizer. Add a lot of right rudder, keep the ball centered, and in about five seconds, you are launched. In comparison, a steep turn to the left uses lots of right rudder, so that detail gives you some idea what is needed in the beginning phase of the takeoff.

The next lesson was to land and do a rollout to a full stop. Oddly enough, the landing was not as hard as I expected. This airplane responded instantaneously to smooth inputs: feather-light inputs, with a quick flick to the left or right. A 45-degree turn seems shallow in the Pitts, and a 60-degree turn feels normal. It doesn't take any effort to have fun.

Flying a pattern with the Pitts is not like doing so with a Cessna 172 or any other airplane I have ever flown. The plane climbs at 2,000 feet per minute; after takeoff and entry into a closed pattern, you turn and stay close to the runway. The sight picture on downwind looks like the airplane's wing is over the runway. Then at the end of the downwind, keep your eyes open and get ready for the descent. When the S-2A's wings are abeam the numbers, you pull the power off and bring the speed to 90 mph. When in a left downwind to base, use the left rudder to keep the ball centered, bank to the left, and stay steady at 90 mph. Before the intersection of final and base, you level off the wings quickly to make sure no one has snuck in on final. Look right, then left, then bank, keeping the runway in sight until you have a slight angle to the runway as your heading.

I LEARNED THAT WHEN THE SIDES OF THE RUNWAY MOVE OR CHANGE SIZE, YOU BETTER FIX IT QUICK!

A typical descent is 2,000 feet per minute, and with a slip, it can be as steep as 5,000 feet per minute, so you never have a hard time reaching any part of the runway if you are fast or close in. The key is keeping the airspeed at 90 mph, and don't cross over the center of the runway. Once you are over the runway, make sure you are going straight down the runway (last chance before you lose sight of the ground), flare when you see the runway on either side of the airplane, hold it in the three-point landing attitude, and wait. The Pitts lands faster than stall speed, so that is why the plane has that scary-looking hop/skip and jump you see when someone lands one. But it is not that scary when you are the one flying it if you keep it straight. The good part is that it does not take long to slow down and come to a stop. The whole process from 1,000 feet above the runway to landing is about 45 seconds. It is a perfect airplane for those folks with a short attention span or no patience.

Back at home after training in the S-2A, when I raised the tail off the ground in my Hatz on my first flight back in the plane, it felt very tame. I had to correct myself from using too much right rudder as I had in the S-2A. Although the airspeed indicator in the Hatz was working and the airplane felt good, the speed felt much slower than indicated. The perception I had of the slower speed resulted in my coming in fast on that first landing. I laughed and remembered what Budd told me; after training in the S-2A, the Hatz would feel different and gentler. And sure as ice cream melts in the summer sun, it did feel peculiar. IAC

Andrea with Budd with his Pitts S-2A excited to take off.

PHOTOGRAPHY BY **KEVIN BROWN,** PHOTOGRAPHY COURTESY OF **ANDREA MCGILVARY**

The Second 25 Years of the U.S. National Aerobatic Championships

IAC 50th anniversary spotlight

BY LORRIE PENNER, IAC 431036

THE U.S. NATIONAL AEROBATIC CHAMPIONSHIPS were held in Texas from 1968 to 2016, took place in Oshkosh, Wisconsin, in 2017 and 2018, and then were moved to Salina, Kansas, in 2019. Salina was picked for its central location, and the organizers expect to make it the home of the U.S. Nationals for many years to come.

The U.S. Nationals brings together pilots from across the United States. Traditionally the event attracts between 90 and 100 competitors. There are five categories for powered aircraft: Primary, Sportsman, Intermediate, Advanced, and Unlimited. There are four categories for gliders: Sportsman, Intermediate, Advanced, and Unlimited. Each category, with the exception of Primary, crowns a national champion.

The U.S. Nationals have been blessed with exceptionally talented pilots, with many winning multiple times as U.S. National Unlimited Champion. In the second 25 years (1996-2019), the next multiple winner was Kirby Chambliss, who won national champion five times, first in 1998 and again in 2002 through 2005.

Record-holder Rob Holland, nine-time U.S. National Aerobatic Champion, with the Mike Murphy Trophy.

Vicki Cruse, U.S. National Aerobatic Champion in 2007. IAC president 2005-2009.

In addition to Patty Wagstaff, three other women have won the U.S. Nationals title: Diane Hakala, 1997; Vicki Cruse, 2007; and Debby Rihn-Harvey 2006, 2008, and 2009.

"Did Diane Hakala go to Denison, Texas, with the idea of becoming the National Champion?" wrote Editor Karen Diamond in the November 1997 issue of *Sport Aerobatics*. While some might go determined to win, Diane said, "I thought about winning — just doing the best I can do." She nailed down her best by diligent practice after her Staudaucher S-300D was down for a month as a result of an aileron issue in late May. During competition in Fond du Lac later that year, she realized her snap rolls were unloading in a different place than before the repairs.

PHOTOGRAPHY COURTESY OF **IAC ARCHIVES**

From Fond du Lac she called Sergei Boriak. The two met in Oklahoma, and Sergei saw her problem on the second flight. "The unload on my snaps wasn't quick enough," Diane said. After training with Sergei, Diane headed to Houston, where she trained and received critique from Debby Rihn-Harvey. Then she went to El Reno, Oklahoma, the traditional practice location for U.S. Unlimited pilots training for the U.S. Nationals. Sergei joined up with Diane in El Reno and coached her for another two days. By the end of Nationals, Diane found herself sitting dazed at the awards banquet looking in awe with her extraordinary grin at the program that listed her name as the Unlimited U.S. National Aerobatic Champion.

In 2007 Vicki Cruse was already the IAC president and a U.S. Unlimited team member. While her IAC duties required a lot of time, if she was home, she was usually able to practice twice a day leading up to competition. She also suffered some maintenance issues that year and had spent just over a month in Spain for the World Aerobatic Championships. Winning at Nationals meant more to her than the WAC, "because it's at 'home' in the United States among friends." Asked how she would celebrate her win, she said, "I've been thinking about an iPhone or a photograph for my house, but I don't think I will be going to Disneyland."

Debby was three-time national champion in 2006, 2008, and 2009 and the 2007 IAC Hall of Fame inductee. Debby, Vicki, and Diane were all U.S. Unlimited Aerobatic Team members, with Debby having the honor of being on the team for over 25 years from 1984 to 2013.

Jason Stephens, five-time U.S. National Unlimited Glider Champion.

The first person to win the championship seven times was Leo Loudenslager, between 1975 and 1982. He held the record number of wins until 2017, when Rob Holland tied his record. Rob was crowned champion first in 2011, and he went on to consistently repeat his win of the championship title through 2019 and is currently nine-time U.S. National Aerobatic Champion.

In the April 2019 issue of *Sport Aerobatics* Rob said, "If I could just practice and do nothing else, and make a living at it, then that's all I would do." He went on to say, "I go to Nationals because it's fun. I like the camaraderie. I like having an actual mechanism to judge myself if I'm improving, if I'm doing better, to try to be better today than I was yesterday." He doesn't keep flying competition to break records or win trophies. He keeps competing because it is a part of his life and it is what he enjoys doing.

The winner of the Unlimited category at the U.S. Nationals is presented the Mike Murphy Cup. Mike was an aerobatic pioneer and leader in international aerobatics for many years. He was not only a competitor, but also a judge and leader in organizing competition aerobatic contests in the United States. Internationally he was the first U.S. delegate to CIVA and the first American to serve as its president. He was delegated to critique the first World Aerobatic Championships and helped plan the second WAC.

In glider aerobatic competition, it is notable that there were also multiple-year winners at the U.S. Nationals. Ken Hadden won the glider Unlimited category three times between 1995 and 1997, and John Lumley won it three times from 1999 to 2002. Jason Stephens, currently the IAC's Glider Program chair, was crowned U.S. Unlimited Glider Aerobatic Champion five times between 2006 and 2013.

The winner of the Unlimited glider category at the U.S. Nationals is presented the Les Horvath Trophy, named after Jason's mentor, Les Horvath of Arizona Soaring at Estrella Sailport near Phoenix. Les was a former member of the U.S. Glider Aerobatic Team and a pioneer in glider aerobatics in the United States. IAC

IAC 50 1970-2020

LOOKING FORWARD

Several pilots from the U.S. Advanced Team spent a few days training in Union City, Tennessee, under the tutelage of team coach Rob Holland. The team continues to prepare for the 2021 World Advanced Aerobatic Championships, to be held in the Czech Republic.

PHOTOGRAPHY BY **COLLEEN CATES**


THE 2020 BEN LOWELL AERIAL
'COW'-FRONTATION

BY DOUG JENKINS, IAC 436255

IT SEEMS IAC CHAPTER 12 has gotten the hang of conducting contests in the pandemic age. From August 28 to 30, the chapter held another fun and successful aerobatic contest — the Ben Lowell Aerial Confrontation. This time it was Contest Director Nick Slabakov at the helm in Sterling, Colorado, at the Sterling Municipal Airport (KSTK). Having gone to school on the contest in July at Fort Morgan, I found that all of the successful mitigation measures were carried forward to ensure the health and safety of all the participants. As a reminder, here they are:

- Most important: If you feel unwell, please stay home.
- Taking the temperature of all participants prior to each morning briefing.
- Doing registration and all briefings either outdoors or in the hangar (not the FBO).
- Placing a portable toilet next to the hangar to minimize the need to go into the FBO.
- Having picnic tables outside where people can eat/hang out while maintaining social distance.
- When you need to go into the FBO, you must wear a face covering.
- When in a car with others (to/from judges line or to/from hotels), you must wear a face covering.
- If you are a member of a judging team and there is a request to wear a mask, please be courteous and wear your mask.
- Plenty of hand sanitizer, masks, and disposable gloves available.

This contest drew 26 pilots eager to compete. There were seven Primary pilots, six hopefuls competing in Sportsman, six more Intermediate flyers, five Advanced aviators, and two Unlimited aspirants. It was the first five-category (non-Nationals) contest that I have been to in a long time. It was good to see the enthusiasm across the spectrum.

PHOTOGRAPHY BY **TOM LAVECCHIA**

As is standard for Colorado contests, Friday was practice day, and the contest was on Saturday and Sunday. Practice day was uneventful with each pilot getting at least one trip through the box. The box at Sterling may be unique in that it is actually a circle. A crop circle, that is. The box is built around an irrigated field with the center pivot of the irrigation system serving as center box. Pretty neat!

The contest began Saturday with a 0700 briefing and engines turning by 0830. We powered through Sportsman/Advanced/Unlimited and then broke for lunch and turned the judges line before we flew Primary and Intermediate. To expedite things, Primary pilots flew their first sequence and then climbed and flew it again, intermingled with Intermediate flying the Known. Once the dust settled, the Intermediate pilots took to the sky again to show off their Free Programs. Afterward, we turned the line again and launched Sportsman/Advanced/Unlimited for their Free Programs as well. It wrapped up a successful Day One!

Day Two also opened at 0700 ... and it was cold. To a Texan flying an open-cockpit biplane, it was really cold! Primary and Intermediate flew first this time with Intermediate flying their Unknown. Afterward, we were back to Sportsman/Advanced/Unlimited until the Colorado winds became an issue. The contest was wisely paused to assess the winds and to give them a chance to subside. That's when the strangest thing I have ever seen at a contest unfolded.

As we were sitting around the hangar (which was cavernous, easily enabling physical distancing) awaiting a decision on the winds, our intrepid contest director approached and asked the oddest question I have ever "herd" at an aerobatic event. "Does anyone here have any experience as a cowboy?" he asked. Naturally, this question got people's attention. Of course, we were in Colorado, so Sportsman pilot Wayne Forbes naturally stuck his hand up and said of course he does, on the professional level no less. I would "steak" my reputation on the fact that at few other contests would you have gotten an affirmative answer to that question.

It seems that a herd of bovines had escaped from their field and were currently wandering on the grass runway and approaching the paved runway. A NOTAM was issued (no kidding) to close the field, the contest was called complete, and the cowpokes got "moooooving" to deal with the "udderly" ridiculous situation. Yes, I will "milk" this for all it is worth. Hopefully you don't have a "beef" with that. The wayward cattle were soon "steered" back to their pasture, and we commenced the usual post-contest activity: cleanup and handing out awards. Did my puns leave you "cow"-ering? I hope not. And that's no "bull."

So here are the actual flying results:

Primary was hotly contested throughout the weekend. After the first run, Josh Gregg (Decathlon) had a 2-point (not percent, point) lead over Dean LaVecchia (Decathlon, the same one) who in turn was only 5 points ahead of third-place Ryan Tierney (in the same Decathlon). Colin Armistead, Andrew Cruce, Daniel Wilmoth, and Aaron Nahale were still in the game as well.

On the second flight, Ryan took first by besting Daniel Wilmoth (in the same well-loved Decathlon) by 8 points. Daniel in turn was only 6 points ahead of Flight 1 winner Josh. Dean followed up his second place on Flight 1 with a fourth on on Flight 2. Colin, Andy, and Aaron rounded out the very competitive field.

The third flight saw Daniel emerge victorious with Colin coming back strong to take second place. Josh followed up his third-place effort on the second flight with another third-place finish. Ryan was only 8 points off the podium. Andy, Dan, and Aaron continued to turn in good scores as well.

When all the numbers were tallied after three flights, Primary results were:

First place – Josh Gregg at 81.69%
Second place – Ryan Tierney at 81.63%
Third place – Dean LaVecchia at 78.94%

Sportsman saw another six tightly grouped pilots flying very well. In the Known, Wayne Forbes rode his Decathlon to a 7-point (again point, not percent) win over Greg Allyn in his Firebolt. Austin Belleau took third in an Extra 330LX, only 14 points out of first. Landon Diedrich, first-time Sportsman Kiley Lynch, and Charlie Riesselman also turned in good flights.

The Free would be the last flight for these pilots due to winds and bovines on Sunday. Austin made it count, scoring above 84 percent. Landon (that very same Decathlon again) was hot on his heels at just over 83 percent, while Greg Allyn clocked in at just a hair under 83 percent. Wayne, Kiley, and Charlie gave these folks a run for their money.

When we handed out trophies, here is how things fell:

First place – Austin Belleau at 79.11%

Second place – Greg Allyn at 78.07%

Third place – Landon Diedrich at 77.66%

As always, Intermediate was a fun and competitive category. Your faithful scribe rode his open-cockpit, 180-hp Pitts S-1 to victory in the Known (underpowered for the *win*) with Craig Fitzgerald in his correctly colored (yellow) Extra 300L nipping at my heels only 5 points (you know the drill) off the pace. Contest Director Nick Slabakov (in his beautiful Extra 330LX) finished a close third, only 14 points out of first. Mike Arensmeyer, Jamie Treat, and James Grenfell were all in striking distance.

The Free also was won by yours truly, with everyone else retaining the exact same order as the Known. And it was just as close, too, with less than 100 points between first and fifth.

The Unknown was my undoing! Craig walked away with the win. Mike (Giles G200) turned in a strong second-place finish while I staggered across the line in third.

Intermediate final standings were:

First place – Craig Fitzgerald at 85.19%

Second place – Doug Jenkins at 84.03%

Third place – Mike Arensmeyer at 83.91%

Advanced brought out the pros; two members of this field were U.S. Advanced Team qualifiers from 2019. After the Known, Jared Hulse flying MSU coach Nick Slabakov's Extra 330LX was in first, Klayton Kirkland and his Pitts S-1 were in second (only 5 points behind), and Jerry Riedinger (Extra 330LC) was in third, only 55 points (out of 3,000 total) out of first. Jim Murray and Mike Forney were hanging in there.

Things turned dramatically in the Free with Mike Forney storming back to take the win. Jared followed up his Known win with second in the Free, and Klayton took third. Jim and Jerry were poised for victory as well.

Again, due to winds and wandering bovines, there would be no Unknown for these pilots.

Advanced final results were:

First place – Jared Hulse at 73.69%

Second place – Klayton Kirkland at 73.00%

Third place – Jerry Riedinger at 69.69%

Unlimited saw two pilots duking it out for top honors. Dick Fennell in his MXS-R took first place in both flights, edging out Dagmar Kress in an Extra 330LX.

I will point out that the same workhorse Extra 330LX flew in every category. I thought that was pretty cool and possibly a unique event.

As always, contests happen mostly due to the work of volunteers, and I would be remiss if I didn't single out the nonflyers who made this contest possible:

Hannah Belleau – cruise director who coordinated food/drinks/logistics throughout

Pat Fogarty – judge, assistant judge, etc.

Betty Stewart – judge, etc.

Peggy Riedinger – judge, chief judge assistant, etc.

Bob Buckley – judge, assistant, etc.

Scott Sowell – scoring and technical support

Meya Luera – chief judge assistant, etc.

Jenna Coffman – judge assistant and connoisseur of bovine humor

Joe Webber – jack of all trades

Tanner Essmayer – jack of all trades

To all of you, thanks! These things literally do not happen without your enthusiasm and effort!

In the end, we handed out some cool trophies, and everyone went home a better person for having spent a weekend in northeast Colorado. Isn't that the definition of a worthwhile event? I think so. See you in Lamar and Llano! IAC

PHOTOGRAPHY BY **TOM LAVECCHIA**

Expanded Envelope Exercises, Almost Aerobatics for Normal Category Aircraft

BY ED WISCHMEYER, PHD, ATP/CFII

INTRODUCTION BY MICHAEL LENTS, *Assistant Professor – Aviation, University of North Dakota, Master CFI – Aerobatic*

Among the pages of Sport Aerobatics *have been tales, teachings, lessons learned, technical reviews, and more for pilots just starting out in the sport to seasoned professionals. There is always something to learn. Maybe for some of us, a single-seat, high-powered monster just doesn't fit the bill when the family wants to fly, too. While brilliant, a Pitts S-1 isn't the machine to take a friend, relative, son, or niece along for the lessons we learn from flying aerobatics. What if there's a targeted way to bridge the gap between aerobatics and more conventional training? What if these maneuvers expand an aerobat's own experiences in ways that rolling for "style points" does not?*

After years of aerobatics and flight instruction (and a few spinal surgeries putting a stop to aerobatics), Dr. Ed Wischmeyer developed E3 as a way to continue teaching the benefits of exploring the flight envelope without the need for more than 2g and parachutes. This approach makes normal category aircraft capable of these maneuvers designed to instill lessons of airmanship. E3 helps a pilot quickly develop a sense for an airplane's control harmony. Dr. Ed Wischmeyer explains more:

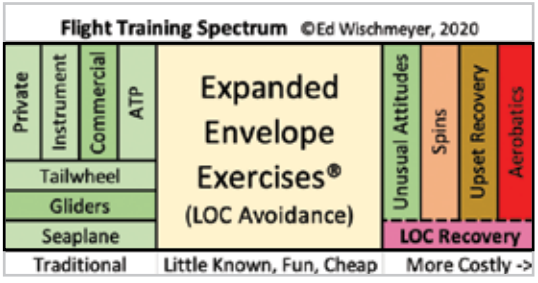
FULL AILERON DEFLECTION in the nonaerobatic RV-9A gives a nice roll rate, even at 80 knots. Under guidance, the nonaerobatic pilot stops at a 60-degree bank and turns 90 degrees, the turn rate impressive at that low speed. We're deliberately not concerned with holding altitude, so the turn is less than 2*g*. After 90 degrees of turn, it's full aileron the other way for another 90-degree turn, then again and again. The pilot does a sloppy job and knows it, but with great excitement asks, "Can we do that again?"

Welcome to the Expanded Envelope Exercises, also known as E3, designed to expand a pilot's personal flight envelope with nontraditional exercises that can be done in most normal category airplanes with less than 60 degrees bank, 30 degrees pitch, 2*g*, and no spins. Originally developed to reduce Loss of Control (LOC) accidents, E3 has an unexpected benefit in that it helps a pilot quickly get a feel for the airplane. And E3 is lots of fun and rewarding.

The new idea in E3 for reducing LOC is to increase the pilot's awareness of what the airplane is doing at all times, rather than training specific VFR LOC accident scenarios. This goal is accomplished by exposing the pilot to an expanded envelope, defined beyond the traditional envelope of *g* and airspeed. The expanded envelope includes full aileron deflections at low airspeeds, roll rates both fast and glacial, stall recoveries beyond the Airman Certification Standards (ACS), landings and taxiing with deliberate offsets from the painted centerline, and so much more. None of it is all that hard, just different.

Ed's RV-9A will happily buffet its way through the E3 exercises.

PHOTOGRAPHY COURTESY OF **ED WISCHMEYER**



The phrase coined for E3 is to increase a pilot's "cognitive availability," the ability to process all of the information already available. External factors aside, pilots don't lose control within their comfort zone because they are cognitively available to process all of the cues. By expanding a pilot's comfort zone, E3 increases cognitive availability. Thus, E3 helps keep LOC precursors from developing into LOC accidents.

But what about the fun, rewarding parts of E3? It's the new sensations, the mastery of the airplane, the learning. A 550-hour commercial/instrument pilot wrote, "In our short E3 flight, I learned things I had never encountered in 25 years of general aviation involvement. The exercises you showed me helped me push the boundaries of my situational awareness ...." A Cirrus standardized instructor pilot put it this way: "The picture out of the windshield, the control feels, the sound, inputs from the vestibular system are all foreign. ... This is an experience that all pilots should have."

Because E3 is so different and some exercises are contrary to the ACS, E3 is not recommended for very low-time pilots.

Safety is most appropriate for E3, which, after all, started out as a safety enhancer. As all pilots know, FAR 91.3(a) states, "The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft." Just because somebody else did something similar in another airplane doesn't necessarily mean that E3 is appropriate and safe for you (or your students) in your airplane.

Safety elements include:

- Many airplanes have a 2*g* limit with flaps extended. Because some E3 exercises can, if botched, inspire a too-vigorous pullout, most all of E3 is flown flaps up.
- Some E3 exercises can quickly lead to spectacular unusual attitudes if the instructor is not on top of the situation. Both for this reason and for the learning experiences, most of E3 is low speed, often well below V_A.
- Because so much of E3 is low speed, clumsy or abrupt control inputs can lead to spins. We flew E3 in a Beech Baron with an extraordinarily well-qualified pilot, but even so, omitted the stall portions of E3 and made sure we had plenty of altitude.
- There are too many safety considerations to be included in this article, and those include airplane selection, exercise selection, instructor pilot qualification, and altitude. Do not assume that aerobatic experience will replace adequate preparation for attempting or instructing all of E3.
- No funny tricks are played in flight. Every exercise is discussed in flight immediately before the exercise.
- Remember FAR 91.3(a). The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.

Here's what a typical E3 flight might look like. The preflight briefing includes discussion of who is pilot in command, pilot skills and recent experience, airspace, and positive transfer of controls — all of the normal considerations. But considering that E3 will be largely outside the student's comfort zone, the briefing is especially important. For want of a better word, "student" is used to describe the pilot seeing E3 for the first time, whether that person is an airline transport pilot, designated pilot examiner, fighter jet test pilot, or mere mortal.

E3 starts on the taxi out. Instead of sticking to painted centerlines, the instructor will ask the student to track pavement joints to the left and right of centerline. This step sets a tone of the pilot being in command of the airplane.

Takeoff and climb to altitude is briefed that the student will fly the airplane normally to clear airspace and a sufficient altitude, just in case. For airplanes unlikely to spin, altitudes similar to those used for teaching commercial maneuvers may suffice. Remember FAR 91.3(a).

The first exercise is usually the glacial Dutch roll. At an airspeed comparable to a fast traffic pattern speed with flaps up — and this will vary from airplane to airplane — the airplane is rolled at 1 degree per second while keeping the nose pointed at a point on the horizon. One degree per second is extraordinarily slow, and even the experienced former military jet test pilots have not done it correctly on the first try. Once the airplane runs out of rudder, the pilot recovers to straight and level at 1 degree per second again, but it is even harder to recover at this glacial roll rate than to enter. Without stopping, a glacial Dutch roll is performed in the other direction with the same glacial recovery.

The glacial Dutch roll is extremely challenging the first time, believe it or not, and has an extremely high workload. It teaches full rudder deflection, of course, but it also teaches that the pilot is in command of the airplane — just like the taxi exercise did. It's worth pointing out to the student that here's something not all that far out of the ordinary, but that is indeed challenging.

Next come the fast Dutch rolls: full aileron deflection to 60 degrees of bank, left, right, left, right, with the nose at a fixed point on the horizon. The airplane is not paused at 60 degrees but immediately rolled the other direction. Entry speed is maybe a little faster than the glacial Dutch roll. In many airplanes, it is best done with rudder to help start the bank. The envelope expansion here is that not many normal category pilots use full aileron deflection, and not many have used rudder with full aileron deflection. A clumsy-footed pilot can quickly get the instructor queasy.

After that part, it is time for some stalls if the airplane is suitable for this exercise and for a variation. Starting at cruise speed or low cruise speed, the airplane is put into a 30-degree bank. Power is reduced to idle; altitude is held with increasing back-pressure, bank is held constant, full flaps are lowered at flap speed, and the airplane is stalled. Bank angle is held constant during the stall and recovery, and power is added gradually. But the nose is not dumped over for airspeed. Rather, the airplane is allowed to accelerate out of the stall, still in the turn. Flaps are retracted when appropriate. After doing this exercise, the variation is to recover in a 30-degree bank in the other direction — if the airplane stall/spin characteristics allow it to be done with manageable risk. A clumsy-footed student could put the airplane in danger of a spin.

Student reaction to this variety of turning stall, especially with the opposite recovery, is usually amazement at what the airplane can do. Of course, this technique is contrary to what is normally taught, but if the student ever has to maneuver at low speed, say, after an engine-out and to avoid an obstacle not seen till the last moment, it is a good experience for the student to have.

Ed getting ready to teach pilots to expand their comfort zones and increase their cognitive availability in stressful situations.

PHOTOGRAPHY COURTESY OF **ED WISCHMEYER**

Somewhere at this point in the E3 flight, both pilots might be ready for a break with straight and level flight. If the student doesn't bring up the topic, the instructor can point out that the student is getting a feel for the airplane, for what it can do. In contrast, during an airplane checkout, the student is taught to master a bunch of maneuvers with completion standards. Once those are mastered, the student is good to go and will, hopefully, get a feel for the airplane over time. An unexpected benefit of E3 is that by focusing on the sensations of the exercises without the distraction of maneuver completion standards, the student will more quickly get a feel for the airplane. And it's lots more fun.

After the break come the 60/90s, mentioned in the opening paragraph. The 60/90s are the poster child exercise of E3, with high sensory input, full control deflection, high roll rates (at least by normal category airplane standards), and turns to a point on the horizon. Holding altitude is not, repeat not, a consideration. It is an exercise, not a maneuver. Entry speed may be a fast traffic pattern speed. I use 80 knots in the RV-9A, but when I enter at 70 knots, the RV-9A will be in the stall buffet most of the time with occasional stall breaks. For my RV-9A airplane with me as safety pilot, it can be a cool learning experience, as the RV-9A will happily buffet its way through the exercise. For other airplanes, maybe not. When we did 60/90s in the Cirrus, the best entry speed was 105 knots. One hundred knots had the nose too high, and to get the highest turn rate, we wanted the speed as low as possible. When we did it in the Baron with the former test pilot flying, he was surprised to get an occasional stall warning. Remember FAR 91.3(a).

The 60/90s are not all sweetness and light, however. One of the early students to attempt it did not apply adequate back-pressure, and the RV-9A was quickly in a low-speed spiral. We hit 80 degrees of bank and 30 degrees nose down — pretty spectacular, but at least I recovered below V_A. Since that episode, I've researched low-speed spirals extensively, and I demonstrate them on E3 flights. I do not ask the student to do them. See chart above right.

Close examination of NTSB accident report narratives and dockets, digital flight data from some accident airplanes, and my own research flights suggest that there are two variants of low-speed spirals that can masquerade as incipient spins:

- A first-accident scenario is that a distracted pilot is late turning base to final, banks steeply, thinks he's high, and pushes the nose over. This situation is a low-speed, low-AOA scenario but can resemble the incipient phase of a spin. In a 30-degree, nose-low situation with the horizon not readily visible to the startled pilot, further nose-down inputs to recover from a perceived spin can be inappropriate. When I've demonstrated low-speed spirals with a relatively prompt recovery, altitude loss is typically 500 feet, with the range being 400-800 feet.

Botched Low Speed Steep Turn: Spiral, not Spin (1 row/sec)

Safety pilot started recovery at green line

AOA	KIAS	Bank°	Pitch°	G	Alt	V/S	Hdg°
0.32	66	15	-3	1.1	-0	- 650	0
0.40	67	43	-5	0.8	-10	- 550	5
0.32	68	68	-10	1.1	-18	- 640	21
0.31	71	78	-20	1.2	-32	- 950	37
0.36	78	80	-30	1.7	-58	- 1720	62
0.28	87	60	-36	1.8	-100	- 2750	86
0.43	94	34	-26	2.4	-160	- 3660	109
0.56	99	26	-9	2.7	-230	- 4050	123
Level flight 7 seconds later…					-390		133

One of E3 exercises is for the nonaerobatic pilot to bank at 60 degrees and turn 90 degrees. Early students to attempt it did not apply adequate back-pressure, resulting in a low-speed spiral.

- A second scenario is a steep turn base to final with inadequate back-pressure. This one feels even more like an incipient spin entry, and the same kinds of unusual attitudes can be encountered. Altitude loss in this scenario is somewhat less than in the first scenario.

The industry has much to learn about low-speed spirals, and much of conventional spiral wisdom is suspect. Putting it into perspective, the Cirrus SR20 and SR22 pilot's operating handbooks state, "If, at the stall, the controls are misapplied and abused accelerated inputs are made to the elevator, rudder and/or ailerons, an abrupt wing drop may be felt and a spiral or spin may be entered. In some cases, *it may be difficult to determine if the aircraft has entered a spiral or the beginning of a spin.*"

Accident data research shows that a major next step in reducing loss-of-control accidents will be a thorough re-examination of low-speed spirals.

There is more to E3, but there's no more room in this article. There are about 100 E3 exercises tabulated so far, and there's room for others to contribute. E3 has been flown in a dozen nonaerobatic airplanes so far, from Cessna 150 to RV-9A to Mooney 205 to Cirrus SR22 to Beech Baron B55. Approving pilots have included three senior former military test pilots. One of those, an intermediate/advanced competition pilot, agrees that E3 teaches things that aerobatics does not.

But for those who are looking to do something different in a normal category airplane, E3 may be just the ticket. The invitation is open to come fly E3 with me in Savannah, Georgia, no charge.

The next steps in E3 development are to get the word out, to get more people to try E3, and to establish an E3 consortium to provide wisdom and guidance beyond my experience. Like aerobatics, E3 must be tailored to each airplane type, including entry speeds, techniques, caveats, and appropriateness for students at various levels. But remember FAR 91.3(a). IAC

ED WISCHMEYER, ATP/CFII, has flown roughly 200 makes and models of aircraft and has been published extensively in general aviation publications. Three spinal surgeries ended his aerobatic flying, but the resulting 2*g* spinal limit serendipitously helped lead to E3. His Ph.D. is from Massachusetts Institute of Technology.

PHOTOGRAPHY COURTESY OF **ED WISCHMEYER**

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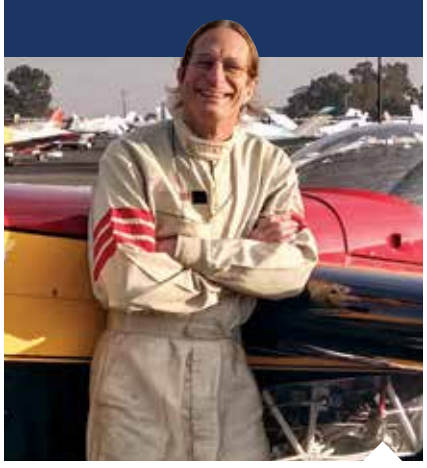

The Stupid Check

BY TOM MYERS, IAC 16830

THE TITLE OF THIS ARTICLE is a reference to a question I have found valuable to ask myself, especially around airplanes. The question is, "Am I about to do something stupid?"

I have found that, in general, it is a good idea to hit the pause button for a moment and confirm that I am really ready to do what I intend to do, that I have minimized the risks associated with what I am about to do to an appropriate level, and that what I am about to do is actually a good idea.

In particular, I will discuss how I apply this concept using a final set of checks I make just before climbing into my airplane. For me, that almost always means for an aerobatic flight, which I believe makes the stupid check even more of a good idea. This is because there is so much mind share being paid to the challenging task of honing complex skills in a demanding environment that it can be easy to forget one or more of the many routine details that are critical to flight safety.

For example, a pilot can spend a long time walking his sequences and reminding himself of what he wants to focus on and accomplish in a practice flight, get himself all strapped into his airplane and ready to start up, only to glance out at the wing and realize that he has forgotten to take off his airplane's pitot tube cover. Guilty. Nothing like 15 minutes of grumbling at yourself while unstrapping, removing the pitot tube cover, looking around for what else you may have forgotten, and strapping in again to reinforce the lesson about paying attention to all of the details.

Another benefit of the stupid check is that it helps give me peace of mind that I have not forgotten something fundamental and critical when I want to be focused on aerobatics. The last thing I want to be distracted with is the nagging thought that I may have forgotten something out of sight like the oil dipstick while I am orbiting in the holding area at a contest before an Unknown sequence.

Please note that the stupid check comes after all the other usual preparations for a flight, including a thorough preflight inspection of the airplane. The stupid check is one last opportunity to take about 30 seconds to make sure I am not about to do something stupid.

THE STUPID CHECK IS THAT ONE LAST OPPORTUNITY TO TAKE ABOUT 30 SECONDS TO MAKE SURE THAT I AM NOT ABOUT TO DO SOMETHING STUPID.

The stupid check for my Edge consists of the following steps.

- I take a several steps away from the airplane. I take a big picture look to assure that there are no chocks or ropes or control locks in place and there is nothing that catches my eye as being unusual or out of the ordinary.
- I walk to the front of the airplane. I assure that there is nothing hiding under the nose or wing that cannot be seen from the cockpit that I would run into when I start taxiing forward. I look down under the prop and brush away any stones just waiting to do their worst to the prop's leading edges.
- I tap each of the fuel caps to assure they are all latched in place.
- I check that the oil dipstick is tightened in place.
- I confirm that all three of the cowling access doors are latched closed.
- I assure that the pitot tube cover has been removed.
- I confirm that the sighting device quick release is latched properly.
- I check my unzippered flight suit pockets to assure that they are all empty. I check my zippered flight suit pockets to assure that they are all closed.
- I confirm that the little tool for locking the main fuel tank cap access door is properly stowed.
- For some of the other aerobatic airplanes I fly, the stupid check varies a little in the details, but it is fundamentally the same.

I have every confidence that you all can come up with and implement your own version of the stupid check and benefit from it greatly. It takes less than 30 seconds and becomes part of the process.

Fly safe. *IAC*

WELCOME NEW MEMBERS

MEMBERS ARE THE HEARTBEAT OF THE IAC, and our heart continues to beat at a healthy pace. In the first half of 2020, the IAC greeted 157 new members into the ranks of aerobatic competitors, regional aerobatic pilots, and enthusiasts from around the United States and the world. In addition, we recognize the members joining or upgrading to a lifetime membership, demonstrating a commitment to enhance the safety, education, competition, and enjoyment of aerobatics.

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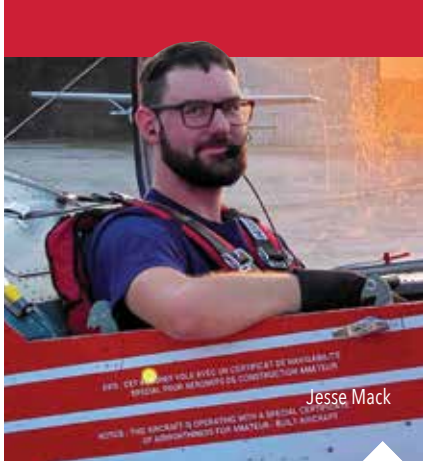
Jesse Mack

Jesse Mack

Family vacation leads to love of aviation

BY ZINNIA KILKENNY, IAC 437244

ZK: YOU HAVE AN ENDEARING BEGINNING TO YOUR AVIATION STORY. NEITHER SWIMMING WITH THE DOLPHINS NOR MEXICO'S CELEBRATED SCENERY COULD COMPETE WITH THE FLYING PORTION OF YOUR FAMILY VACATION.

JM: My introduction to aviation was quite different from a lot of people. I never had any family members that introduced me to flying. When I was a kid, my family took a trip to Mexico, and despite all the exciting activities we did there, my favorite part was the flight down. My dad would often joke that if he had known, we would have flown somewhere much closer (and cheaper, ha-ha!). Shortly after, we researched the Royal Canadian Air Cadets, where I eventually learned to fly through their cadet program.

ZK: WHO GAVE YOU YOUR FIRST AEROBATIC FLIGHT?

JM: My first proper aerobatic ride was from a friend at the Winnipeg Gliding Club, who took me up in his Super Decathlon. At the time, I already had my heart set on doing my aerobatic training, but this flight sealed the deal. I was even lucky enough to have him walk me through an aileron roll and a loop.

Jesse Mack clinches a second place finish in Intermediate at the Canadian Nationals in Rocky Mountain House, Alberta, Canada.

ZK: FROM VOLUNTEERING TO FLYING IN THE BOX, HOW DID YOUR FIRST CONTEST GO?

JM: As part of my time building toward my commercial license, I planned a flight from Manitoba, to Alberta, Canada. The timing worked out that coincided with the Rocky Mountain House Aerobatic Contest. Since competition flying was already on my radar, I inquired about volunteering. When I initially contacted them, they asked what I was flying out in, and if I would be interested in competing. Considering I was flying a Cessna 172, I had quickly written off any chance at flying in the contest and planned on learning as much as I could through volunteering. After flying nearly 700 miles across Canada, I nearly fell out of the plane at Rocky Mountain House Airport on arrival.

The next day was the practice day. I arrived at the airport ready to volunteer when the person I contacted earlier mentioned that one of the partners in a Christen Eagle was willing to be a safety pilot if I would be interested in competing in Primary. I was a little reluctant as it had been more than a year since my last aerobatic flight, and two years since my training in a Pitts Special. I eventually agreed to go up for a practice flight, and if it went well, I would fly the competition.

My safety pilot took the time to walk me through the Primary sequence, taught me about the box entry and wing wags, and then strapped me into the front seat of the Eagle for my practice flight. We ran through the sequence three times, and after fumbling through it the first two times, I figured it out pretty well the third time through and was confident enough to compete the next day.

The contest day came, and with the beautiful weather, we finished all three flights in one day for every single category. Between each flight, I was too nervous to check the scores to see how I was doing against the other two competitors, but I would read the judges' sheets for feedback to see how I could improve each subsequent flight.

Finally, at the end of the day, we had our awards banquet, where I found out that I had somehow won my first competition that I unexpectedly flew.

PHOTOGRAPHY COURTESY OF **JESSE MACK**

The Super Acro was a kit airplane developed in the 1980s by Zenair in Canada (aka Zenith in the United States).

JESSE MACK

IAC: 440285

Chapter: Aerobatics Canada 7 (AC7)

Occupation: Heavy construction estimator/project manager

FAA Ratings and Certificates: PPL/GPL


Jesse on the ramp getting ready for his turn in the aerobatic box.

ZK: YOU CURRENTLY FLY A ZENITH SUPER ACRO, A CHRIS HEINTZ DESIGN. WHAT DREW YOU TO IT?

JM: I was looking for a Pitts S-1 but I couldn't find any that I liked. A friend put his Super Acro up for sale. The kit was designed and manufactured in the '80s to compete with the Pitts S-1. This particular example was the last one built and had a couple of modifications that addressed problems the other Super Acros had.

ZK: WHAT ARE YOUR GOALS?

JM: Short term, I would like to refine my flying for Intermediate next year and fly down to the U.S. Nationals next fall. Long term, I would like to try out for the Canadian team for the World Advanced Aerobatic Championships in Vegas in 2023. Eventually, I would like to get my hands on an Unlimited level monoplane and see how far I can make it flying Unlimited, maybe fly at the World Aerobatic Championships one day.

ZK: WHAT HAS BEEN YOUR PROUDEST MOMENT?

JM: I have been fortunate to reach so many milestones this early in my aviation/aerobatic career. I think the moment that tops the list for me was my first solo in the Pitts S-2B. I was expecting my checkout in the Pitts to finish off with my instructor telling me to buy a Pitts S-1. But after a day of annoying the tower in the circuit, my instructor told me to make the next one a full stop, so he could see if I could land the plane without going off the far end of the runway. I was feeling so confident until he hopped out and started tying up the belts in the front seat, and I could feel my feet begin to shake on the pedals.

I think that successful first solo gave me the confidence to push on with my aerobatic career and make each milestone after that. IAC

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