



SPORT

AEROBATICS

MARCH/APRIL 2024

OFFICIAL MAGAZINE OF THE INTERNATIONAL AEROBATIC CLUB

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AEROBATICS
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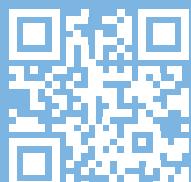
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COVER

ON THE COVER:

A.J. Wilder flies his Extra 330SC over the arid landscape in Southern California.
Photo courtesy of Figure 1 Foundation.

ABOVE:

Jean, Nevada, was the site for WAAC 2023. Brilliant blue skies prevailed for the duration of the championship.
Photo by Steve Johnson.

Publisher: Jim Bourke, president@iac.org

Editor: Lorrie Penner, editor@iac.org

Contributing Authors: Alain Aguayo, Jared Bachman, Jim Bourke, Nick Buckenham, Bob Freeman, Duncan Koerbel, Greg Koontz, Mike Heuer, DJ Molny, Leah Murphy, Chris Olmsted, Gordon Penner, Lorrie Penner, Jared Sebesta, Jeff Smith, Amy Spowart, A.J. Wilder

Senior Copy Editor: Colleen Walsh

Copy Editors: Jennifer Knaack, Bryant Shiu

Proofreader: Tara Bann

Print Production Team Lead: Marie Rayome-Gill

IAC CORRESPONDENCE

International Aerobic Club, P.O. Box 3086

Oshkosh, WI 54903-3086

Tel: 920-426-6574 • Fax: 920-426-6579

Email: execdir@iac.org

ADVERTISING

Advertising Manager: Sue Anderson, sanderson@eaa.org

MAILING

Change of address, lost or damaged magazines, back issues.

EAA-IAC Membership Services

Tel: 800-843-3612 • Fax: 920-426-6761

Email: membership@eaa.org

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Changes at IAC HQ, Reflecting on Volunteers and WAAC 2023

BY JIM BOURKE, IAC 434151



WHETHER YOU ARE JUST GETTING STARTED or someone who has flown aerobatics for many years, I look forward to enjoying an exciting 2024 contest season with you!

The first event for this year is the Estrella Classic at Arizona Soaring in Maricopa, Arizona. This contest is not just a regional glider contest; it also serves as the 2024 Advanced and Unlimited Glider National Championship.

While it is still early in the year, there are already many volunteers working hard: the 2024 rulebook is in a final draft form and about to be published; our judge chair is putting together the judge school materials and scheduling judge classes, our AirVenture volunteer crew is planning merchandise orders, and our many contest directors and chapter leaders are undoubtedly filling out contest waiver applications and making big plans for trophies, banquets, and all the other details needed to make this season a success. Whoever you are and whatever you are doing, thank you for volunteering.

Departure of Steve Kurtzahn

Many of you have enjoyed the pleasure of working with Steve Kurtzahn, who has served the IAC as executive director since October 2019. By the time you read this, Steve will have moved back into his previous role as a Lutheran pastor. I know how much everyone enjoyed working with Steve. He's the one who handled all the contest sanctions, trophies, merchandise sales, paperwork (there is a lot of this), Unknown sequences, membership issues, phone calls, invoices, insurance questions, taxes, and about a million other things. If you interacted with the IAC at the headquarters level, you were surely interacting with Steve.

For fun, I looked back on all the work we have done together, and I found that we had more than 2,000 email conversations! That shows you how much communication it takes to keep the IAC going. Phew! Thank you, Steve!

The Future of *Sport Aerobatics*

At the fall board meeting, the IAC board of directors reviewed the budget and decided to transition the content of *Sport Aerobatics* to a digital format. The motion made at the meeting was deliberately open-ended to give EAA and yours truly some time to put together a plan. Therefore, we do not have a schedule for this transition put together yet, nor has anyone decided what type of digital content we will end up with. We are in the exploratory phase of this endeavor, with more questions than answers. We will be considering our options in more detail at the spring board meeting.

This is a tough subject that could become controversial, so it's important to say that the IAC board is always interested in hearing constructive feedback. To guide your comments, please recognize that while the IAC is not in financial peril, advertising income is just not what it once was, and you can trust that this board is aware of the value *Sport Aerobatics* brings to the aerobatic community.

Some of you will recall that *Sport Aerobatics* was published 12 times a year until recently (January 2021). The switch to six issues a year was met with general acceptance by the membership.

Watch for a chance to give your feedback via a survey that we sent out at the beginning of the month, which will allow you to rank the importance of *Sport Aerobatics* against the IAC's other offerings, but you can also always email me directly at president@iac.org.

WAAC Recap

As I reflect on 2023, I think most fondly about the time I spent coaching the U.S. Advanced Aerobatic Team. We had a pretty good showing at the World Advanced Aerobatic Championships (WAAC) with a third-place overall finish.

Once when my son asked me for advice about how to get a job, I told him the trick to an interview is to solve three problems. Employers need someone who 1) can do the job, 2) is reliable, and 3) is pleasant to work with. I'm not sure where I picked that advice up from. I'm sure I didn't come up with it myself, but it caused me to think deeply about the sort of personality traits other people need to see in us. He just got his first real post-college job as a software engineer at Boeing, and he feels that advice did the trick.

If I could describe the 2023 U.S. WAAC team, those are the qualities I'd score them most highly

on. 1) They were capable, big time: talented pilots with lots of good experience. 2) They put in the practice: They found the money, time, and mental wherewithal to make it to camp without making excuses. 3) They were a real blast to be around: good humored, caring, and curious.

Aerobatic folks are naturally competitive and can sometimes forget to work as a team. But this group was tight from the beginning to the end.

Judging Is Hard

I got some great feedback on my comments last month about how judging is hard. I guess we all agree that it is. If you aren't an aerobatic judge, this is a great time of year to get involved because the IAC's judge training schools will be in session soon. Even if you have no interest in being an active judge, you will find these schools rewarding because they will give you a lot of background information that is useful as a competitor, registrar, or other volunteer. Also, it's nice to set aside some time to sit in a classroom with your buddies and talk about airplanes, don't you think? **IAC**

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The NAA and Its Relationship to the IAC

BY AMY SPOWART, NAA PRESIDENT AND CEO



AS A MEMBER OF THE IAC, you may have yet to hear of the National Aeronautic Association (NAA), or you may have heard of the NAA and wondered what the NAA is and what it has to do with the IAC.

My name is Amy Spowart, and I am the president and CEO of the NAA. I want to share where the NAA came from, our relationship with the IAC, and, most importantly, why you should care who we are. First, I would like to thank the fantastic Lorrie Penner and Jim Bourke for the opportunity to share this information with the IAC's dedicated members.

What is the National Aeronautic Association?

The NAA has been around for a while. While not quite as old as that first flight on December 17, 1903, we were founded shortly after. And, while we may not have been present in Kitty Hawk or Dayton, Orville and Wilbur knew us. Orville chaired our Contest and Records Board and was very engaged with the NAA. The NAA was the first issuer of pilot certificates in the United States, and until 1926, Orville signed each one. This board still exists and helps oversee many of the activities of our Air Sports Organization (ASO) members.

Why should I care about this 119-year-old organization?

As a person interested in aerobatic flying as a pilot, judge, support person, or anyone with ties and affection for the IAC mission, you may be more interested in the NAA than you think. The NAA, which was founded in 1905, has a distinct purpose. The NAA is honored to oversee the advancement of the art, sport, and science of aviation and space flight. We do this by fostering opportunities to participate fully in aviation activities and promoting public understanding of the importance of aviation and space flight to the United States.

Again, why should I care?

Simply put, our strategic goal is to help the IAC advance its purpose and goals.

Does the IAC need us?

Our core value is publicly and proudly supporting U.S. air sports, including the IAC. We also supply the IAC membership with sporting licenses required by the

Fédération Aéronautique Internationale (FAI) to compete at the championship level. We do a lot more than issue these licenses.

Here are the highlights. In carrying out our mission, the NAA will:

- Develop opportunities to strengthen mutual objectives of the NAA's corporate members, air sports organizations, affiliates, and institutional members, and regional aero club members, as well as aid in the formation of affiliated aero clubs in U.S. cities where such organizations do not now exist;
- Represent U.S. aviation throughout the world as the U.S. National Air Sport Control (NAC) of the (FAI);
- Encourage, coordinate, document, and promote competition and record-making aviation and space events following the rules prescribed by the FAI;
- Recognize and reward those who make outstanding contributions to the advancement of aviation and space flight through presentations of awards and other honors;
- Endorse sound national programs and other efforts designed to help the U.S. remain a leader in aviation and space flight;
- Support and encourage aviation and space education programs; and
- Promote and encourage public participation in and appreciation of U.S. aviation and space activities.

The continued success of the NAA mission depends on the alliance we share with ASOs and other NAA members. We strive to improve our value proposition for those aligned with us. As a nonprofit, we wish to serve those we represent thoroughly. Where IAC needs us, we will be there, and where IAC excels, we will be there.

How does the NAA carry out the mission listed above?

The NAA endeavors to:

- Drive excellence with recognition through awards such as the Collier, Mackay, Brewer, and the Wright Brothers Memorial trophies.
- Sanction and bestow authority to Americans representing the best in international air sports.
- Promote and foster appreciation for the art of flying and strengthen the aerospace business.
- Encourage the study, establishment, and deeper understanding of the science of aeronautics in all forms to encourage inventions and improvements in the field and across the industry.
- Assist our membership in ensuring a sustainable and reliable aviation system.

The National Aeronautic Association and the International Aerobatic Club are a team united to promote and advance the sport of aerobatic flying within the United States and the world. We do this by fostering opportunities for exposure to the sport, educating the public about what is possible, celebrating those who excel at aerobatic flying, and promoting safe, competitive flying.

You likely won't ever find me in an airplane doing loops, rolls, or spins, but you may find me at a competition cheering Team USA very loudly. What I can't handle in the air, I more than make up for on the ground. I am proud to be your partner and advocate. **IAC**



2024 IAC CONTEST SEASON CALENDAR



Chapter 3



Chapter 36

[IAC.org/Contests](#)



DATES	HOST CHAPTER	NAME	REGION	LOCATION	AIRPORT
March 21, 2024	62	Estrella Glider Classic	Southwest	Maricopa, AZ	E68
March 21, 2024	62	U.S. National Unlimited/Advanced Glider Aerobatic Championships	Southwest	Maricopa, AZ	E68
March 21, 2024	89	Snowbird Classic in Memory of Nikolay Timofeev	Southeast	Keystone, FL	42J
April 18, 2024	36	Hammerhead Roundup	Southwest	Borrego, CA	Lo8
April 26, 2024	23	Sebring 87	Southeast	Sebring, FL	KSEF
May 10, 2024	24	Lone Star Aerobatic Championships	South Central	Graham, TX	KRPH
May 17, 2024	3	Mark Fullerton Memorial Bear Creek Bash	Southeast	Rome, GA	KRMG
May 31, 2024	15	Harold Neumann Barnstormer	South Central	Ottawa, KS	KOWI
May 31, 2024	38	NorCal Aerobic Contest	Southwest	Tracy, CA	KTCY

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Soaring Beyond Horizons

Unveiling Mario's sky-borne symphony with the Figure 1 Foundation

BY AJ WILDER, IAC 434702, AND CHRIS OLMSTED

IN THE BUSTLING CITYSCAPE OF CHICAGO, where skyscrapers become sentinels touching the clouds and the rhythmic hum of urban life becomes the heartbeat of the city, Mario Del Boccio, a budding aviation enthusiast, found himself drawn to the skies. Living a mere five minutes from O'Hare International Airport, his childhood was punctuated by the graceful dance of airplanes descending from the heavens. His interest in aviation flourished with encouragement from his grandfather, who was a mechanic on the P-47 Thunderbolt.

At the age of 14, Mario's love affair with aviation grew deeper when a family friend, a member of a local flying club, took him on his maiden flight. The sheer exhilaration of being airborne left an indelible mark on his young mind. In that transformative moment, Mario realized that flying was not just a fleeting fascination; it was a lifelong calling.

His passion led him to start his training at LeTourneau University in Longview, Texas, where he had his first introduction to tailwheel aircraft in a Citabria. He completed his private pilot certificate, instrument rating, commercial pilot certificate, and finally CFI. As Mario navigated through the maze of aviation training and his love of working with his hands, he could indulge in his love for flying but also acquire the skills to work on the very machines that fueled his dreams.



Pursuing his A&P mechanic certificate while also actively training for his CFI-I and multiengine rating kept him busy, but it didn't prevent him from gaining the experiences of flying skydivers and tracking wildlife. He also interned for United Airlines in its flight operations department for three months. Mario graduated cum laude with the class of 2019 from Southern Illinois University, Carbondale, with a Bachelor of Science degree in aviation technology and an Associate in Applied Science in aviation flight.

In pursuit of his dream, a challenge loomed on the horizon — finding a flight training establishment that offered scholarships tailored to tailwheel or upset recovery training. During Mario's search for the right scholarship, the Figure 1 Foundation stood out as one of the few offering scholarships for tailwheel and upset recovery. Mario was eager to explore the nuances of aerobatics and master the intricacies of unconventional flight, and the Figure 1 scholarship became the natural choice. He discovered the foundation's commitment to nurturing a new generation of

"That was amazing to me because I had never been in inverted flight. Having the experience really opened my eyes to the possibilities."

— Mario Del Boccio



skilled aviators resonated with his aspirations, setting the stage for a journey that would redefine the trajectory of his life.

Upon being awarded the Figure 1 upset recovery and introduction to aerobatics scholarship, Mario embarked on an aviation odyssey marked by zeal and determination. His first lesson was nothing short of exhilarating — soaring into the sky and experiencing inverted flight. Inverted flight is one of those maneuvers that typically makes many pilots apprehensive, but it successfully marked the commencement of Mario's venture into the realm of aerobatics.

"That was amazing to me because I had never been in inverted flight," Mario said. The intentional choice to commence with inverted flight showcased Mario's unwavering resolve to embrace every facet of aviation, even the unconventional. "Having the experience really opened my eyes to the possibilities."

Reflecting on his experience, Mario emphasized the invaluable nature of upset recovery training, describing it as a skill applicable to a myriad of situations. It transcended the confines of a niche and became a cornerstone of his aeronautical prowess. Recognizing the substantial addition to his professional repertoire, Mario acknowledged that this training would be a potent résumé builder, distinguishing him in the competitive world of aviation.

In essence, Mario's journey with the Figure 1 Foundation epitomizes the essence of passion meeting opportunity. From a teenager gazing at airplanes descending over Chicago to a scholarship recipient pushing the boundaries of flight, his aviation journey is a testament to the transformative power of dedicated organizations fostering the dreams of aviation enthusiasts. Not only did the scholarship give Mario the means to pursue his passion, but also it equipped him with the skills to shape his aviation career today and for years to come.

Since 2021, Mario has been employed by Republic Airways as a first officer and an RJet ambassador. (Ambassadors provide resources and information to peers interested in working for Republic, promote brand awareness, and attend events with the campus team.)

Mario's aviation journey serves as an inspiration for aspiring aviators, demonstrating that with the right support



Co-Founders Chris Olmsted and A.J. Wilder

and opportunities, the sky is not the limit — it's just the beginning. It's not merely a financial aid package; it is a ticket to a world where passion meets purpose, where the thrill of inverted flight is just the starting point for an exhilarating aviation adventure.

About the Figure 1 Foundation

The Figure 1 Foundation emerges as a fresh reminder of the early days, when aviators relied on sight, sound, and feel to pilot an aircraft in the lost art of stick and rudder skills. Co-founded by AJ Wilder and Chris Olmsted in 2016, it's dedicated to educating, enabling, and inspiring the aviation community at the grassroots level. Nearly 60 scholarships have been awarded since its inception. The foundation acts as a conduit between philanthropists and aspiring career-based pilots, connecting them with high-quality flight training. Visit Figure1Foundation.com. **IAC**



Transformative Experience

2023 IAC CP Aviation EMT Scholarship in Memory of Vicki Cruse

BY LEAH MURPHY, IAC 442679

WHEN I WAS FIRST NOTIFIED of my selection as the recipient of the 2023 IAC CP Aviation EMT Scholarship in Memory of Vicki Cruse, I was unaware of just how transformative the experience would be.

In October I traveled from my home in New Jersey to Santa Paula, California, to train with Master CFI-Aerobatic Rochelle Oslick at CP Aviation. Absolutely blown away by Rochelle's professionalism, knowledge, and expertise, I knew any hesitation I had going into the course was assuaged, knowing she would be by the controls with me.

Without wasting any time, we immediately began familiarization with the aircraft and recognition and recovery of stalls. While most pilots might find this exercise routine, the majority of my 1,500-plus flight hours are straight and level, and this challenged my senses to better understand what the airplane was telling me. Using the building blocks of learning, each lesson expanded from the previous one, and by the end of my time there, I found myself flying an aerobatic sequence.

From emergency maneuvers to aerobatics, the course pushed the boundaries of my comfort zone and opened my eyes to the incredible possibilities within the realm of the IAC. Newfound skills and confidence gained from executing these maneuvers not only elevated my flying abilities but also ignited a passion for paying it forward.

I am incredibly grateful for this experience and am honored to have been able to participate in Vicki Cruse's legacy. While there is always more to learn and aviation is not a destination but rather a continuous journey, my experience with the IAC CP Aviation EMT Scholarship gave me the confidence to continue forward as an aviator and flight instructor. **IAC**

Leah Murphy is a dual-rated pilot, airplane single-engine land and helicopter. She is a flight instructor in the New York City area. When outside of the flight deck, Leah leads STEM educational activities with schools at a local wind tunnel and volunteers with the FFASTeam.



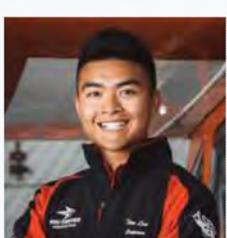
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'The Leo' – 2023 National Point Series Championship Results

BY BOB FREEMAN, IAC 8532

THE 2023 SEASON SAW AN INCREASE IN pilots meeting the three-region criteria for competing for the National Point Series Championship and the annual Leo trophies. As a reminder, the NPSC is a national point series composed of ranking points for pilots who fly in at least three different IAC regions. It is no small commitment, and this series recognizes those who rank highly in doing so across the nation. Pilots meeting that criterion are ranked at the end of the season by adding the ranking points they earned in their best contests in those three regions. NPSC titles and trophies are awarded in Primary, Sportsman, Intermediate, Advanced, and

Unlimited. Bob Freeman, Tim Just, and Tom Rhodes sponsor this series and its trophies.

This year, we did not have any Primary pilots who flew in three regions, sadly. Eight pilots flew in two regions and needed only one more contest to qualify. Maybe next year?

In our biggest category, 111 Sportsman pilots flew in IAC contests this year! Eleven of those pilots flew in two regions, and two pilots flew in three regions. This year's NPSC Sportsman winner is Mark Haven (1.394 NPSC points). Mark flew in the Ohio Fall Frolic (Mid-America), James K. Polk Open Invitational (Northeast), and the Mark Fullerton Memorial Bear Creek Bash (Southeast). Richard Corredera finished second this year (0.509 NPSC points).

Fifty-three Intermediate pilots flew in IAC contests in 2023. Of those, 12 pilots flew in two regions, and three pilots flew in three regions. This year's NPSC Intermediate winner is Jerry Esquenazi (2.68 NPSC points), who flew in the James K. Polk Open Invitational (Northeast), the Mark Fullerton Memorial Bear Creek Bash (Southeast), and the U.S. Nationals (South Central). Second place



MARK HAVEN



JERRY ESQUENAZI



STAN MOYE



JIM BOURKE

went to last year's winner, Leigh Hubner (2.22 NPSC points), and third place went to Corey Gerulis (1.77 NPSC points).

Sixty-two Advanced pilots flew in IAC contests this year. This is a great turnout, considering many of these Advanced pilots spent a lot of time preparing for the 2023 World Advanced Aerobatic Championships held in October in Nevada. Of these, 11 pilots flew in two regions, and six pilots flew in three regions. This year's NPSC Advanced winner is Stan Moye (1.8 NPSC points), having flown in the Ohio Fall Frolic (Mid-America), the U.S. Nationals (South Central), and the 86th Sebring and 1st Christmas Bash (Southeast). Stan narrowly edged out second-place finisher Dave Taylor (1.757 NPSC points). Third place went to Ekaterina Volkova (1.464 NPSC points).

We had 21 Unlimited pilots enter contests across the country this year, only one of whom flew in three different regions. President Jim Bourke is the inaugural NPSC Unlimited winner (1.783 NPSC points), having flown in the Corvallis Corkscrew (Northwest), the Snowbird Classic (Southeast), and the U.S. Nationals (South Central). The remaining 20 pilots flew in either one or two regions.

Summary

Sportsman: (1) Mark Haven,
(2) Richard Corredora

Intermediate: (1) Jerry Esquenazi,
(2) Leigh Hubner, (3) Corey Gerulis

Advanced: (1) Stan Moye, (2) Dave Taylor,
(3) Ekaterina Volkova

Unlimited: (1) Jim Bourke

P&P 227

Per the IAC Policy & Procedure Manual, first-place winners get trophies, recognition letters and stickers, an announcement in *Sport Aerobatics* magazine, and names added to the permanent Leo trophy. Second- and third-place winners get recognition letters and stickers and an announcement in the magazine.

Congratulations to everyone on a successful 2023 season! For those on the fence about flying a third region, just do it! **IAC!**

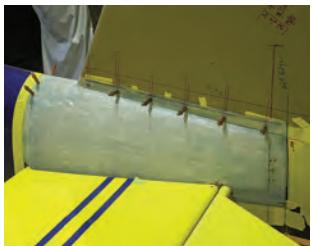


Labor of LOVE —



the DR-109

BY JEFF SMITH



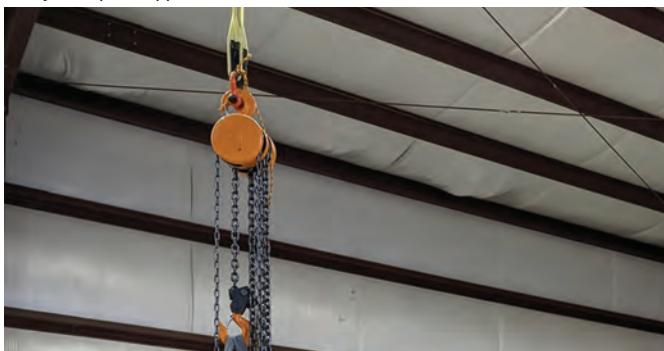
Left: Tail fairing build. Right: Tail test assembly.



Base yellow paint applied.



Top: Following the traditional One Design paint scheme.
Bottom: Testing, sanding, buffing, taping – all worth the final outcome.



Hanging the engine, running hydraulic lines,
wiring the instruments.



Top: Taping for the stripes.



Left: Dodge red stripes. Right: End result.



Cockpit dash.



Fitting the canopy.

SPRING 2023. Well, I finished it. I wasn't sure I'd ever say those words. And yet, deep in my gut I'd always known I would.

It was 1997. I had been flying some basic aerobatic aircraft, such as Super Decathlons, and was really hooked on the sport. The precision, the unusual attitudes, the feeling of freedom creating my own roller coaster in the sky. I naturally started to look for higher-performance options as I got more familiar with maneuvers and the basics. There weren't any realistic options for renting much beyond a Super Decathlon, so I started to look around at purchasing options.

As I looked around at aerobatic aircraft, I was introduced to the idea of homebuilt aircraft, which had never occurred to me before. The more I read, the more I was hooked on building something myself. The satisfaction of completing my own aircraft was enticing in a way that struck deep within me. For quite a while, I was really taken by the Christen Eagle. What a lovely airplane; what a great kit! I even believed the marketing hype — 800 hours (as I recall) of build time! Wow, I could be flying in a year. Nothing looked all that complicated; I was already quite familiar with woodworking and electronics.

And then ... then a 1997 *Sport Aerobatics* issue was delivered to my mailbox. And wow, that DR-109 was an amazing-looking aircraft. A monoplane, just like the slick Extra 300Ls I saw at air shows. I talked to Dan Rihn, designer of the DR-107 One Design and DR-109, about the design, construction techniques, and the kits.

I was really impressed and flew down to Los Angeles to take a test flight with Dan. I'd never been in such a high-performance machine. Sure, lots of fast cars, lots of fast motorcycles in my life, but nothing compared to this beast of an aircraft. Just think about it, and the airplane did it.

Three-point takeoffs, power everywhere all the time, symmetrical wing, amazing roll rate. I was hooked and placed an order for the kit from Aircraft Spruce & Specialty as soon as I got home.

Naturally, the first few kits went together really quickly. First step was building the ailerons. Beautifully CNC router-cut ribs and spars, easy to glue together. Within a short period of time, I had some real airplane parts in my garage. I was already visualizing the first takeoff, in my mind not much longer than a year.

Soon, the wing was built, the fuselage had arrived and was powder coated, I was playing around with paint systems, and the engine was built. And okay, maybe not flying in a year, but really, I was "almost done." Sure, I had read many times that 99 percent done means 50 percent left, but I just couldn't see how that was possible. I was so close.

Around 2000, I had the wing mounted, fuselage on the gear, all the pushrods and flying surface installed. Then I stepped back and actually started to think about the rest of the project. I needed to learn fabric. I needed to get up to speed on hanging the engine, running

I'd never been in such a high-performance machine. Sure, lots of fast cars, lots of fast motorcycles in my life, but nothing compared to this beast of an aircraft.



The test flight took place early October 2023.

hydraulic lines, wiring the instruments. And reality set in. Wow, I had a lot of things to learn, a lot of things to experiment with to make sure I did them correctly.

Around that same time, a job change happened, as well as a divorce. The project settled down a few notches in priority but was never forgotten. Selling it was not an option. I was going to finish and fly it. Somehow.

As I'd been building the aircraft, I had gotten to know Bill Scheunemann quite well. He helped guide me through all the aileron and wing construction with many tips on techniques and tools. He suggested that perhaps I would want to move the aircraft to his shop in Wisconsin, where he could help me find people to do avionics wiring and teach me fabric and perhaps painting. Fortunately, part of my job change involved being in Chicago about once a month for several years. I found an aircraft specialty hauler, and off it went to Bill's shop in Wisconsin. During the next two to three years, the wir-

ing was completed, engine installed, avionics installed, canopy fit, tail covered, and all surfaces primed. Okay, this time I was really "almost done, it just needs paint." Famous last words ... "just needs paint."

I had really wanted to do the final painting, but with yet another job change, I had no time. Bill introduced me to Bob Buzzell, also in Wisconsin, a fantastically skilled painter and fabric covering expert, so I moved the "ready to paint" aircraft to his shop. As we got into the project, the surfaces that I had thought were ready to paint actually needed quite a bit more work to get to the level I wanted. And I'd looked at double-coated fabric installations and decided that was really a much nicer look. Ugh, okay, re-cover it all.

Fast-forward to 2015. The airplane was still at Bob's shop. A combination of me changing jobs (again), not being able to spend any time in Wisconsin, and Bob taking on other work led to a decision to move the project back to California. At least it would be nearby, and I'd have a better chance of finishing it.

As of early 2020, I still had not done anything of substance on the airplane, so I made the difficult decision to sell the kit. I had two serious buyers, but then COVID-19 hit, lockdowns got worse, jobs were lost, and both possible sales fell through. My industry continued to be shut down, and in late 2021, I figured I may as well spend my free time finishing my DR-109. I had been thinking about it for a while, but by now I had finally realized how much work it would take to learn to paint, get the equipment needed, and find the right paint system. But it wasn't going to paint itself, and my industry was still shut down, so I got started.

It was satisfying to get back to finishing the surfaces I'd spent so much time building and shaping. What I didn't count on is just how much work there was. Pinholes appeared that I hadn't seen before. Slight imperfections became visible as the larger ones were eliminated. Prime, sand, prime again, sand further. Meanwhile, lots of priming and painting on fabric test panels. I figured this was worst-case scenario — flexible surface, stitching, seams, small round tubes, all of which had to be sanded without burning through paint and taped with no bleed.

Then it was time to pick a paint system and colors. I had wanted to follow the traditional DR-109 paint scheme that Dan designed. It highlighted the lines of the airplane and was designed for ground visibility in competition. I knew I wanted a brilliant yellow with red stripes and a dark gray or purple. I also knew that purple and yellow can look like a cheesy high school football team logo, so I had to choose wisely. I started by looking for just the right yellow. I wanted something very bright, super saturated and warm. I had always loved the Lotus Solar Yellow; it was dimensional and brilliant, bright yellow in the sun and warm in the shaded areas. I had a sample batch mixed and loved it. It is a two-part process, with a base yellow and pearl coat. I found a nice bright Dodge red and a clean metallic purple that worked perfectly with the yellow.

As I continued with testing, I started to see orange peel where I had once thought it was nice and smooth. I got better with my technique, but still couldn't spray a glassy-smooth final clear coat. I had been reading a bit about cutting and buffing, but figured there was just no way I would go to all that work. The total surface area, the curved and detailed surfaces — it just seemed

All the years, all the setbacks, the hours, the worries. And now, it was actually flying. Still gives me chills as I write this.

I had really wanted to do the final painting, but with yet another job change, I had no time. Bill introduced me to Bob Buzzell, also in Wisconsin, a fantastically skilled painter and fabric covering expert, so I moved the "ready to paint" aircraft to his shop. As we got into the project, the surfaces that I had thought were ready to paint actually needed quite a bit more work to get to the level I wanted. And I'd looked at double-coated fabric installations and decided that was really a much nicer look. Ugh, okay, re-cover it all.

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Twenty-five years after starting the kit, Jeff stands beside his DR-109 with a sense of accomplishment and satisfaction.

like an overwhelming task. But, just to double-check, I did a bit of sanding and buffing. Once I saw the quality possible, I couldn't unsee it. After more testing to find the most efficient and proper techniques for sanding and buffing, I bought clear coat and resigned myself to many hours of additional work.

Finally, I was ready to start on the fuselage. I had painted all the parts that were pure yellow. I had tested a bunch of full-color panels with stripes. I felt okay about my basic skills, but the task was quite

daunting. It required painting four coats of yellow on the side skins, tail, and cowlings. Let those flash, then take everything out of the booth, assemble skins and cowls on the airframe, laser mark the strips. Mask every-

thing except the red stripes and N-numbers, paint the red, pull the masking, and paint four coats of pearl over the red and yellow. Pull everything back out of the booth and mask for purple; back in the booth for three coats of purple metallic. Flash and then two coats of clear. All this within 48 hours. There was no margin for error; any big mistakes would require stopping, sanding, and starting over. But there

was really no option but to just dive in and do my best. After a long two days, it was done, and I was quite happy with the results.

The wing was relatively easy after the fuselage. At least I knew I could reliably tape without bleed. I could make straight lines with a laser, and I could get it all done within two days.

After all the base painting was complete, it was a long slog of sanding everything with 800-grit, painting two more coats of clear, then sanding with 3000-grit and lots of buffing.

At long last it was all assembled, its engine was tuned, the FAA paperwork and inspection were completed, and it was ready to test fly. This was May 2023. By this time, I hadn't been flying in a long time, and I had no experience soloing this sort of aircraft. Finding the right person took some time, but I finally spoke with Todd Ashcraft, IAC 21499, while he was at Oshkosh. We clicked, and he seemed like the perfect pilot to test-fly my DR-109.



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Our schedules aligned, and we met in early October for the first flight. After quite a bit of last-minute issues, Todd lined up and in 300 feet was off the ground and headed for the sky. I can't even put into words the feelings when it took off. Thrilled, terrified, relieved, amazed, speechless. There's just nothing like it I've ever experienced. All the years, all the setbacks, the hours, the worries. And now, it was actually flying. Still gives me chills as I write this.

And the more we flew, the better it got. Performance was more than I'd hoped for. No bad habits and tracked straight and true on the ground. Really not much to do but run through the test cards and put the hours on.

By the end of 2023, 25 years after starting the kit, the DR-109 has been the one constant in my life throughout so many twists and turns, so many changes in priorities and situations. It is hard to communicate the sense of accomplishment, the satisfaction in sticking with it, the self-confidence built through learning new tasks and achieving acceptable results. Not only did I finish the airplane, but I've learned self-discipline, patience, and to never give up on difficult tasks. **IAC†**





WAAC 2023 Opening Ceremony

The 2023 World Advanced Aerobatic Championships

COMPILED BY LORRIE PENNER, IAC 431036

REPORT AUTHORS: DUNCAN KOERBEL (USA) CONTEST DIRECTOR, NICK BUCKENHAM (GBR) CHIEF JUDGE, AND MIKE HEUER (USA) INTERNATIONAL JURY PRESIDENT

PHOTOGRAPHY BY: LORRIE PENNER, JERRY ESQUENAZI, JIM BOURKE, LENORA CRANE

THE GENESIS OF WAAC 2023

IN THE LAST WEEK OF OCTOBER into the first week of November 2023, the United States hosted the 15th World Advanced Aerobatic Championships in Jean, Nevada. Fifty-eight pilots (six of these were hors concours H/Cs-independent pilots who are not part of any country's team) from 15 countries participated in the second largest championships (WAC or WAAC) in the last decade and the largest ever held in the United States.

With the agreement of the IAC board of directors, the bid for the championship was originally submitted in person by

Duncan Koerbel in 2018 at the CIVA Plenary meeting in Warsaw, Poland. At the time the championship was scheduled for 2022, which eventually was rescheduled to 2023 due to numerous FAI championship events that had to be postponed due to a global disruption caused by COVID-19 in 2020.

Even with the date change, producing a successful international event is a time-consuming and intensive project. Time flew by with so many details to plan, which included fundraising, lodging, fuel/oil supply, transportation, meals, and volunteer recruiting to name a few. In order to help with preplanning, Duncan made a successful bid to the IAC board to hold the 2019 IAC West Open Championship in Jean, an airport that had not been previously utilized for IAC competitions. The October 19-20, 2019, contest was a good test run and helped the planning team get their arms around the local logistics.

Because the airport at Jean has been lightly used by the general aviation community over the years, there was no infrastructure. The WAAC 2023 planning team took on the herculean task to



“create” a tent city on the ramp for contest operations, briefings, and accommodation for each team. Power, water, and Wi-Fi were available throughout the event. Lunches were organized by Susanne Koerbel of the highest quality, and more than 1,200 meals were provided on-site. Toward the end of the competition, briefing times were moved to earlier in the morning, and breakfast for the judges and jury were also provided in the briefing tent so all judges could be on-site for 0745 briefings to facilitate an earlier start to the flying.

In addition to the tent city on the ramp, judging locations were split in two locations (on the east and west sides of the aerobatic contest box), and so two judges stations were set up under the beautiful azure skies. Surrounded by sagebrush, tumbleweeds, cactus, and sand, there was not much to entice the judges except comfortable seating and sun shelters to protect them from the dry sunny days.

WAAC BEGINS

Two zones were available prior to the event: a training box to the northwest of the airfield providing a separate area for practice before and up to the start of the event as well as the designated



Team USA at the opening ceremony.



The Canadian team includes Lenora Crane (left) and Carol Holyk (right).

area for the championship some distance to the southwest of the active runway. Official practice days ran from Sunday, October 22, through Tuesday, October 24.

Training days saw good weather with little or no wind. The drawback – temperatures heating up to over 90 degrees Fahrenheit. Both aerobic boxes were filled from morning until evening with the sound of the loud pulsating whine of multiple MT propellers and Lycoming engines.

Opening ceremonies at world championships will typically see a parade of nations, and WAAC 2023 was no exception. The brightly colored flags and a rainbow of team uniforms brought a brightness to the tarmac against the backdrop of the buff-colored Sheep Mountain and Bird Spring Range foothills.

After the parade, the first order of business was the drawing for order of flight for Programme 1 and a judges briefing. Under the current [FAI] Sporting Code, determining and preparing the order of flight can be complex. On this occasion the drawings were done using gambling chips with the contest logo on one side and the number on the other.

A TYPICAL DAY AT WAAC 2023

All of the competitors and judges rode by car or van from the South Point Hotel and Casino to the Jean Airport (19.3 miles). Once there, a daily briefing took place followed by judges being moved out to the judges line.

For the majority of the championship the flying weather was outstanding with unlimited visibility and virtually no wind when flights were being conducted. Competition flying usually commenced with one of two warmup pilots: Craig Gifford of the United States flying an Extra 330SC and Martjin Kersten of the Netherlands flying a CAP-232. Both flew the Low (200 m) and Low-Low (100 m) levels when requested and provided high-quality sequences with intentional “errors” for the judges to detect.

Wind measurements were conducted frequently during the championship by drone operation throughout the majority of the contest. Once when the wind was close or over limits warmup pilot Craig Gifford provided additional backup information for the drone by using his GRT EFIS to record and calculate wind speed, and direction. Thanks go out to Craig for his assistance. Fortunately, only two days were lost to high winds.



Tent city.





Mike Lents with supportive family and friends.



Luke Penner with coach Aaron McCartan.



Three Pitts entered the championship: H/Cs Anthony Oshingua, Yuichi Takagi and Australian Darrel Whittaker.



Volunteer Susanne Koerbel organized high-quality lunches daily.

Lunch was served midday, and afterward the judges returned to judge from a location that facilitated keeping their faces protected from direct sun glare. The judge line consisted of Chief Judge Nick Buckenham (GBR), who was assisted by Leif Culpin and Jen Buckenham, and judges Jerome Houdier (FRA), Galyna Suprunenko (UKR), Steve Todd (GBR), Violeta Gedminaite (LIT), Eladi Lozano (ESP), Laszlo Liskay (RSA), Edward Waasdorp (NLD), and Peggy Reidinger (USA).

For those times when a video was needed, a suitable monitor (42 inches) was available in a slightly darkened tent adjacent to the chief judge's position. There were times when the judges came in off the line for lunch and conducted their video review utilizing a 65-inch TV monitor in the briefing tent. The video operator, Dan Agre from California, became proficient at providing a good standard of recordings.

Throughout the championship a simple frame and mobile phone arrangement, modeled after the same type used at the U.S. Nationals, was used to capture and send photos of all judging sheets to the scoring office. The quick turnaround enabled scorer Mary Beth Rudd to quickly enter the judges' marks and publish updated results at regular intervals. Occasionally sheets were held pending hard zero (HZ) resolutions that required close study of the flight video recordings.

The quality of sequence flying was more than usually variable, reflecting the wide range of pilots and skills that had been able to enter the championship. "Rivalry between competitors toward the top of the results in each program was consistently high and very rewarding to judge," said Chief Judge Nick Buckenham.

The Free Unknown process consisting of figures, composition of sequences, checking, and creation of L-R Forms is one of the chief duties of the organization and the International Jury. "Thanks go out to Pierre Varloteaux, Tamás Ábrányi, and Bob Freeman of the WAAC 2023 organizing team, who worked closely and well together to get the job done," said International Jury President Mike Heuer.

THE FLYING

As the first day began there was quite a bit of excitement on Team USA as Brittanee Lincoln enjoyed a first-place finish out of the 11 competitors that would fly that day until the winds grounded the rest of the competitors. Once the weather cooperated and the championship continued, the top three finishers in Programme 1 (Free Known) were revealed: first place, Tommy Douillard flying Extra 330SC N330XS owned by



IAC member Grant Nielsen; second place, Jeremy Renard flying a CAP-232 that was shipped from France; and third place, Vlad-Alexandru Popescu flying an Extra 330SC shipped from Romania.

The American team finished well in the first flight with nearly all landing in the top 20. Captain of the Canadian team Luke Penner finished in ninth place in Programme 1. “It’s a privilege to be a part of this, regardless of how it goes,” Luke said. Although team members Jerzy Strzycz and Dave Barbet had flown at the championships in 2008 at Pendleton, Oregon, history was made at WAAC 2023 as this was the first time that the Canadians fielded a full team for a world championship.

The first of three Free Unknowns saw two pilots from the French team, Vladimir Gras and Tommy Douillard, both flying Grant’s Extra 330SC to first and second place finishes. Dan Stefanescu in the Romanian team Extra 330SC finished in third place. Marty Flournoy from the U.S. team flew his best flight of the championship, placing fourth with a score of 76.820 percent to Dan’s 76.833 percent third-place finish.

In the second Free Unknown the French and Romanians continued their domination. Vladimir (FRA) finished first, Dan (ROU) finished second, and Tommy (FRA) finished third. Hot on Tommy’s heals was U.S. team member Kyle Collins with a fifth-place finish of 77.4245 percent to Tommy’s 77.618 percent score.

With the wind out of limits for two days, the schedule became tight. The International Jury agreed to a cut of 50 percent of the pilots for the final Free Unknown. This put Programme 4 at 25 pilots to fly since the H/Cs were cut for this flight as well. It was agreed not to go beyond 25 because it was clear there would not be time, and preparation had to be made for the ceremonies that evening. With an early start, lunch, and judges breaks, all were flown with the schedule finishing almost exactly as predicted after 1600 PDT on November 3, 2023.

Until the final scores were run, it was hard to tell who had come out on top. During Programme 4 Paul Chesneau finished in first flying Extra 330XL N330AN owned by IAC member Nick Slabokov, and Vladimir finished in second in Grant’s Extra 330SC. Although Vladimir had placed in the top three previously, Paul had not, and Tommy had finished in fifth place and Romanian Dan finished ninth in Programme 4.

Flying his best flight of the championship, U.S. team member Mike Ciliberti clinched third place for a bronze medal. Earlier in the championship Mike had experienced a mechanical issue

with his MX Aircraft. As required, he aborted his flight, landed, and proceeded to the sterile area. Upon inspection, the “push to talk” button on the top of the stick had come loose in the stick. Because he could not troubleshoot the problem, he made the correct decision to land and was allowed to refly later.

When the scores were finalized, the points added up to Tommy Douillard (FRA) as the new World Advanced Aerobatic Champion, followed by second-place finisher Vladimir Gras (FRA) and Dan Stefanescu (ROU) in third.

Team USA placed third overall in the team standings with highest-scoring pilots Brittanie Lincoln, Kyle Collins, and



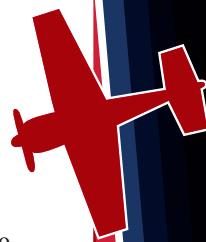
Bob Freeman's Extra was used by members of the Brazilian team.



Dave Watson (HC) flew his MX Aircraft MX2.



Canadian Jerzy Strzycz getting ready next to his Sukhoi 26.



World Advanced Aerobatic Championships

2023



N43DM (David Martin's plane) flown by two Swiss and one Lithuanian pilot.



YR-EXC flown by the Romanian team.



Canadian Luke Penner's Extra 330SC.



Judge Galyna Suprunenko (Ukraine) and Dmitry Pogrebytsky



Assistant Gilles Guillemard with judge Jerome Houdier (France).



Judge Peggy Riedinger (USA) with assistant John Smutny.



Assistant Eugenius Raubickas with Judge Violeta Gedminaitė (Lithuania).



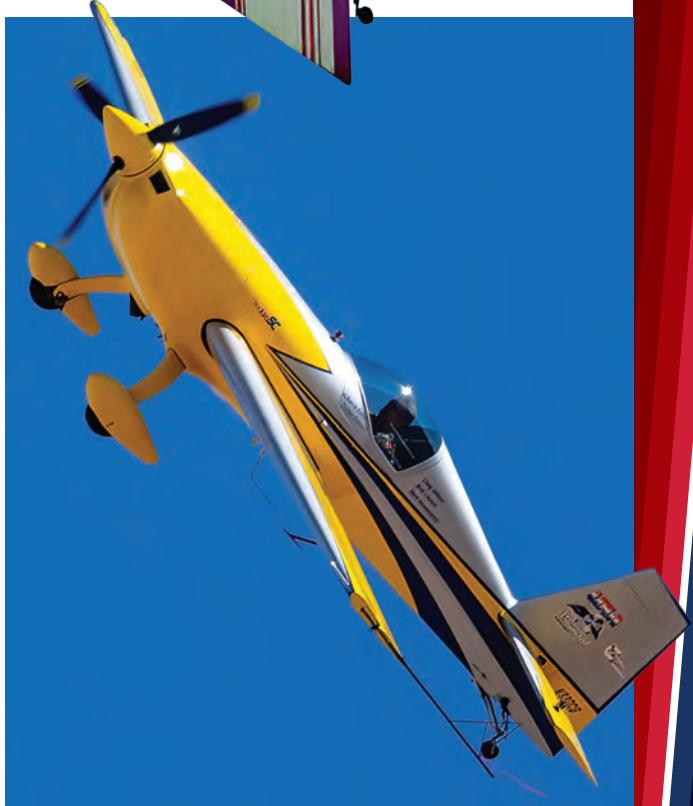
N330FZ flown by South African pilot Elton Bondi.



F-HLYK cap 232 flown by French pilot Jeremy Renard.



C-GXRS Giles G-200 flown by Canadian Neil Harris.



Craig Gifford flew his Extra 330SC as warmup pilot.



Judge Steve Todd (Great Britain) with assistant Brian Gleave.



Assistant Guy Auger with judge Edward Waasdorp (Netherlands).



Assistant Johnnie Smith with judge Laszlo Liskay (South Africa).



Assistant Rene Meuer with judge Eladi Lozano (Spain).



Seated at the chief judge table, left to right: Jen Buckenham, Nick Buckenham and Lief Culpin.



Judges video review in the briefing tent.



Volunteer Mary Beth Rudd served as registrar and scoring director.



Mike Heuer with fellow jury member Tamas Abranyi from Hungary.

Mike Ciliberti having an overall score of 75.119 percent. Their race against the Romanians was only 0.625 percent off the second-place Romanians who finished with a total overall score of 75.744 percent. The first-place team was the French pilots with an overall score of 77.888 percent.

CLOSING CEREMONIES

More than 200 people dressed in their best packed into the ballroom at the South Point Hotel and Casino Friday evening. The ceremonies were conducted and narrated by contest director Duncan Koerbel. A lovely buffet with a wide selection for dinner preceded a volunteer recognition, a gift presentation to Chris Olmsted of Figure 1 Foundation (one of the championship's major sponsors), and the awards presentation.

Volunteers are usually the key to success whether at a regional, national, or world championship event. It would be impossible to name all the volunteers in the limited space here, but without each and every one of them, WAAC 2023 could not have happened. The volunteers who all spent 10 days working hard in unforgiving heat and wind, away from friends, family, and jobs, were integral to the operation of a safe and enjoyable championship.

Duncan thanked all of the judges, their assistants, and the jury and called out a few key volunteers to receive acknowledgement: Mary Beth Rudd, the scoring director and registrar; Mark King, who acted as air boss; Barrett Hines, who filled the role of ground boss; and Bob Freeman, who oversaw other volunteers in the Free Unknown process.

It was a night of honoring skilled pilots and for them to bask in the glory of winning awards at a world championship. For the main business of the evening, Duncan, who was assisted by Mike Heuer and Nick Buckenham, presented the winners with FAI flight medals and diplomas.

One controversy that marred the evening was the absence of the Peter Celliers Trophy, which is a traveling trophy awarded to the overall champion. The trophy was won in 2021 by Russian pilot Dmitry Samokhvalov. Since Russia was suspended from the FAI, the trophy never made its way to the United States. Because of Russia's suspension, the former CIVA delegate of Russia stated that Russia did not recognize WAAC as a world championship and would return the trophy to FAI and CIVA when Russia's pilots can participate again.



Congratulations to the U.S. team members left to right: Mike Ciliberti, Brittanee Lincoln and Kyle Collins for their third-place finish at WAAC 2023.



Awards banquet in the South Point Hotel and Casino ballroom.

Despite the wind delay, the absence of the Celliers trophy, and long days out in the Nevada desert, the 15th FAI World Advanced Aerobatic Championships were concluded on a high note. The World Advanced Aerobic Champion was crowned, old friends reunited, new friends made, and great flying happened at an exciting location near Las Vegas, a city known as the Entertainment Capital of the World. A place where the teams, their family, and friends were able to not only indulge in their passion for aerobatics, but also enjoy some of the local color. Whether it was a stroll down Fremont Street, being mesmerized by the Fountains of Bellagio, taking a Wild West horseback ride, spending a bucket of quarters at the slot machines, or driving exotic race cars, there was something for everyone. WAAC 2023 will not soon be forgotten. **IAC**



Congratulations to the World Advanced Aerobatic Champion Tommy Douillard (FRA) in the center, second place Vladimir Gras (FRA) and Dan Stefanescu (ROU) third place.



FAI medals.

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How Can I Get Into Aerobatics?

BY ALAIN AGUAYO, IAC 435356



PERHAPS ONE OF THE QUESTIONS I get asked the most by aspiring pilots, flight students, and even fellow pilots is “How can I get into aerobatics?” or “How did you get into aerobatics?”

Getting your feet wet and entering the world of aerobatics is an exhilarating endeavor that requires not only a passion for aviation but also a strong commitment to safety and a disciplined approach to learning. There are many ways to get involved, such as finding a reputable flight school or club and flying with a qualified instructor or even in your own aircraft.

While the idea of buying your own airplane and teaching yourself might sound like a tempting adventure, it is crucial to point out that this way is not the ideal path, or at least not one I would recommend.

In this article, we will explore the exciting world of aerobatics, focusing on the importance of proper instruction, training from an experienced certificated flight instructor (CFI), and the significance of choosing the right flight school. I will also explain how I personally discovered aerobatics and how my training began.

First things first. Whether you are interested in aerobatics to see how it



Alain in his MX Aircraft MX2.



Aguayo Aerospots instructs in this beautiful Super Decathlon.

To understand the intricate world of aerobatics, seeking instruction from an experienced certificated flight instructor is a must.

feels, improve your flying skills, gain experience, compete later down the road, or whatever your reason may be, I encourage you to join the International Aerobic Club. Chances are that if you are reading this article, you are already a member of the IAC. But if you happened to borrow this magazine from a member, then take it as a sign to join.

Joining the International Aerobic

Club can be beneficial for individuals looking to try out aerobatics, as it provides a structured and supportive community dedicated to the promotion of sport aviation. Through the IAC, aspiring aerobatic pilots gain access to resources, including training programs, safety guidelines, and mentorship opportunities that facilitate skill development and enhance aviation knowledge. Additionally, if you are looking to compete, becoming a member will offer you the chance to participate in organized competitions.

Aerobatics, the art of performing precise and controlled maneuvers in an aircraft, is a fascinating side of aviation that attracts enthusiasts and professionals alike. From loops and rolls to spins and hammerheads, aerobatics allows pilots to push the boundaries of traditional flying, experiencing the thrill of three-dimensional movement.

One way of getting your feet wet (assuming you are already a pilot) is to go purchase your own aerobatic aircraft and essentially “teach yourself” how to do it. If it is the path you’re thinking of taking, I encourage you to reconsider. While the idea of self-teaching may sound like an independent approach, it comes with a myriad of problems. Learning aerobatics is difficult and requires a thorough understanding of aerodynamics, precise control inputs, and most important, safety practices and procedures. Without proper guidance, pilots risk making critical mistakes that could lead to accidents.

But even harder than learning it is unlearning it. You don’t want to develop bad habits from the get-go since they will hinder your ability to progress, possibly developing tendencies that could lead to unsafe flying. Attempting to teach yourself aerobatics also neglects the structured growth necessary to develop skills. Aerobic maneuvers build upon each other, and attempting advanced maneuvers without mastering the basics can result in loss of control and other potentially hazardous situations.

To understand the intricate world of aerobatics, seeking instruction from an experienced certificated flight instructor is a must. A CFI with aerobatic expertise brings a wealth of knowledge, ensuring that you receive proper guidance and adhere to safety standards throughout your training.

Experienced CFIs not only provide technical instruction but also offer valuable insights into the mindset and discipline that are required. They can identify and correct errors, tailor instruction to individual learning styles, and drill a strong focus on safety practices. If competing is your reason or end goal, I would go a step further and recommend receiving instruction from



Diving into the aerobatic box in Oshkosh, Wisconsin.

a CFI who is actively competing. Once you have the basic maneuvers and fundamentals down and feel safe doing so on your own, having a ground coach can also be extremely beneficial since a coach has a different perspective of your flying, essentially seeing what the judges would see.

Picking the right flight school or flying club is just as critical. Look for schools with a proven track record in aerobatic training and a team of

skilled CFIs. Researching the reputation of a flight school and reading reviews from past students can provide valuable insights into the quality of instruction and overall experience. Additionally, inquire about the school's safety record, maintenance practices, and commitment to education.

Reputable flight schools offer structured training programs that take students through a progressive series of aerobatic maneuvers. These programs typically start with fundamental maneuvers, such as loops and rolls, before advancing to more complex figures like spins and inverted flight.

Although you may be eager to start flying right away, there's more to it than just hopping in the airplane and taking flight. Structured training ensures that students develop a solid foundation, gradually building skills and confidence under the guidance of experienced instructors. As an aerobatic instructor



Competition pilots at the 2018 Sebring aerobatic contest.



Aerobatics is an exciting and extremely rewarding activity.

myself, I would spend many hours of ground school with my students before even showing them the airplane. My philosophy is learning occurs on the ground, and then we apply what we have learned in the air.

Aerobatics demands a great focus on safety, and this mindset should be introduced from the beginning of your training. Understanding the aerodynamics, recognizing the limitations of your aircraft, and practicing emergency procedures are all crucial aspects of safe aerobic flying. An experienced CFI will emphasize safety protocols and help you develop a keen awareness of factors that can impact aerobic performance.

So how did I do it? How did I get involved? While I was attending college, I learned about a flying club in the area (Eagle Sport Aviation) that offered tail-wheel, glider, and aerobatic training. As a poor college student back then and conducting flight training at the same university, it was somewhat unrealistic to get involved in extracurricular activities, especially ones that required flying. More flying equals more money. Fortunately, this club was a nonprofit organization, and because of that, it kept the operating cost quite low, which made it feasible for me. If my memory serves me correctly, it was about \$160/hour dry for a Pitts S-2B

back in 2009, which was unheard of. Furthermore, what helped me tremendously was the fact that I received quality instruction from experienced CFIs from the get-go, all of whom were competing at some level in this same Pitts. They were there to point out my mistakes and weak areas, which in turn mitigated developing bad habits and unsafe practices.

Aerobatics is an exciting and extremely rewarding activity that

requires dedication, discipline, and a commitment to safety. While the appeal of teaching oneself may be tempting, the risks associated with this approach far outweigh the benefits. Choosing the right flight school and working with an experienced CFI ensure a structured and safe progression through the world of aerobatics. **IAC***

Alain AGUAYO is a professional pilot with a Bachelor of Science in aeronautical science and a Bachelor of Science in aerospace and occupational safety. He has a total of 5,300 hours of flight time and a total of 1,650 hours of aerobatic flight time. His certificates and ratings include ATP, instrument, SEL, SES, MEL, MES, CFI, CFI-I and MEI. Alain has been a flight instructor for 11 years, working at Eagle Sport Aviation from 2013 to 2017 and Embry-Riddle Aeronautical University from 2013 to 2022. He currently runs Aguayo Aerospors, specializing in aerobatic and Upset Prevention and Recovery Training (UPRT). Instructional services are given in a 2021 Super Decathlon. The first aerobatic contest that he flew in was the 62nd Fall Sebring contest in 2010. He started out flying aerobatics in the Eagle Sport Aviation Club's Pitts Special S-2B. He currently flies an MX Aircraft MX2.

While the idea of self-teaching may sound like an independent approach, it comes with a myriad of problems. Without proper guidance, pilots risk making critical mistakes that could lead to accidents.



Upset Recovery and Three-Dimensional Thinking

BY GREG KOONTZ, CFI, IAC 20242



IN 1971 AT THE RIPE OLD AGE OF 18, I became a professional pilot by being hired to flight instruct at the same little airport I built up my flight time flying my Cub. As it went along, a few students asked me to fly them (or their employees) around in their airplanes. These were Cessna 182 Skylanes, a Cessna Skymaster, a Cessna 210 Centurion, and a Beechcraft Travel Air. It gave me a taste for what one day became corporate flying. But before that time, I moved to St. Augustine, Florida, to work for Aero Sport Inc., doing air shows and teaching aerobatics. Eventually, I ran its Part 141 school and developed a Part 135 charter operation. We flew Senecas around Florida and Georgia and often to the Bahamas. One day, a student, who owned a sizable business, bought a new Piper PA-31 Navajo from us and leased it to my charter department. Insurance required professional training in this type, so I began to experience the world of simulator-based flight training.

A few years passed, and I left Aero Sport to take a position as chief pilot for a big company in Birmingham, Alabama. Corporate flying like this required a professional and clearly safety-focused operation. Flying jets and turboprops required 6-month simulator checkups and standardized cockpit procedures. I worked that job for more than 20 years before running away to join the circus, the flying circus, that is.

By that time, I had been running a little aerobatic school on weekends for



Greg Koontz Airshows inverted ribbon cut.



about 10 years. I had a Super Decathlon; I was also flying about eight air shows a year. The bug to be a full-time air show pilot had overcome my common sense, and now I had no steady income, just instruction income and barely a hope of making money on the air shows. But fate brought good fortune, and today I can say I have been an aerobatic instructor for 50 years. I don't know exactly how many hours' worth or how many students — my wife would tell you a gazillion at least!

Let me tell you something I have learned; most people seek out aerobatic lessons for unexpected reasons. Depending on Alabama weather, I have about 67 students make it through my school each year. One or two want to try competition

aerobatics, maybe a dozen have a Decathlon and want to learn how to do what it does, and the rest are looking for confidence. They want to feel like they could handle bad situations better. They want to prepare for that evil dragon called an aircraft upset. These days, all the flight magazines and all the aviation bloggers have covered the need for upset and recovery training over and over again. I thank them all for the valuable marketing! The point is most of my flight time is teaching aerobatics to people who really don't want to do aerobatics.

Some situations call for a well-trained and frequently rehearsed technical procedure. Other situations, such as an upset in your Cessna 172, will hit you like a slap in the face and so require some immediate flying.

I have 26 years of simulator-based flight training. I remember the day our instructor at the main training center announced that they were adding upset training to the curriculum. I was a longtime aerobatic instructor by then, so I was

interested to see exactly what their approach to it was going to be. It didn't surprise me one bit. We got this special briefing about the hazards of all kinds of turbulence and where to expect it. We learned a special memorized checklist for the proper rollout. When we went to the sim and got our upset, it went quite well; in fact, it went too well. You understand, simulators don't turn upside down, so when we pushed a little, there was no negative g to contend with. Nor was there any adverse aileron yaw because the sim wasn't programmed to simulate the reverse rudder need at negative angles of attack. In fact, what they were teaching was to use the wrong rudder in the roll, which in the real world would cause a big, inverted skid into negative dihedral, resulting in a poor roll response in most airplanes. To top it off, it was all done on the attitude indicator as if it was IMC conditions.

Flying as a professional crew member, especially on jets and turboprop aircraft, is a different world. We trained



Greg has been flying surface-level air shows since 1976.

regularly, learning methods and procedures for any and everything. We were standardized in these techniques so everyone would know what to expect. We practiced them all

every six months in the dreaded simulator. We went over our procedures regularly with “captain briefings” before we did anything like takeoffs and instrument approaches. We were being paid to always be professionals with a high safety standard.

I believe pilots flying for personal reasons are now trained for more technical aspects than ever before. It's typically technical people who are attracted to operating aircraft these days. But my experience is that most private

operators don't use the same procedures and practices of the professional who flies every day. It's understandable. When I fly my Cessna 180 to the pancake breakfast, it's about having a fun day. Sure, I use a checklist and follow the rules, but it's a more relaxed operation. It is why trying to teach [the big training center] way just doesn't work well for the casual flyer.

So, some situations call for a well-trained and frequently rehearsed technical procedure. Other situations, such as an upset in your Cessna 172, will hit you like a slap in the face and so require some immediate flying. While you're trying to remember a

As long as being upside down is not your norm, you will be stumped when the situation arises. It is why I decided to teach the applicant who is seeking out upset recovery skills to do basic aerobatics.

aspects than ever before. It's typically technical people who are attracted to operating aircraft these days. But my experience is that most private



push-roll-rudder-control phrase while upside down or a power-aileron-rudder-elevator jingle while you're in a fully developed spin, the airplane is continuing without you! Most pilots just don't practice that stuff enough to have a checklist hanging out in our conscious memory. What really matters is learning how to fly the airplane instead of memorizing how to operate it. It is why you're going to call me an old stick and rudder flyer.

I believe we should fly our single-engine private aircraft not by a long string of acronyms and memory procedures but by the same method we operate most vehicles, by understanding the logic by which it works. I call it three-dimensional thinking. Sure, I use memorized checklists for short tasks and written checklists for technical tasks (before-takeoff checklist). But no one I know is going to ask the person in the right seat to hand them the "upset/recovery checklist" while hanging upside down! And after 50 years as a flight instructor, I can assure you the average casual flyer will not have a memorized checklist poised at the front of their memory waiting for such an unusual situation.

As long as being upside down is not your norm, you will be stumped when the situation arises. It is why I decided to teach the applicant who is seeking out upset

recovery skills to do basic aerobatics. Specifically, they are loops, rolls, and spins as a minimum. Loops teach people how to get out of a vertical dive (the unavoidable aftermath of a spin recovery). The tendency there is to under g the pull, therefore losing more altitude and building up a serious amount of speed.

Next comes the basic aileron roll. For this purpose, I teach a zero-lift roll. It builds good control over pitch, so the airplane doesn't get overcontrolled. But the key thing here is that at zero g , you have cut off the lift. Since the idea is you are upside down, you don't want lift pulling you down into a split-S. That's what typically happens, and it's ugly.

Finally, I have my students do half a loop and then an aileron roll to roll out at the top. It basically has the student putting themselves into an upside-down scenario. I used to flip the airplane over, then pronounce, "You got it," but I gave up on doing that because it takes too long for the student to engage the aircraft.

The loop, roll, and especially the roll-off-the-top-of-a-loop are repeated over and over. As that progresses, I introduce the idea of some top rudder as the airplane goes through knife-edge attitude to better hold the nose up.

With enough practice, the student becomes more adapted to the unusual attitude and gains a more natural orientation to it.

In my experience, instead of using a technique dependent on a memorized checklist, the student is more likely to make a good recovery down the road using muscle memory, or in other words, three-dimensional thinking.

IACF

Greg Koontz is a certificated flight instructor since 1972 with more than 10,000 hours instructing. He has experience in more than 190 aircraft, received the FAA Regional 2010 Instructor of the Year award, and is the recipient of the FAA Wright Brothers Master Pilot Award. Flying surface-level air shows since 1976, Greg is also a designated aerobatic competency evaluator.



Training Inverted Spins

Gaining spin proficiency

BY JARED SEBESTA, IAC 435804, GAMBIT AVIATION



YOU'VE JUST SET THE VERTICAL LINE for a quick hammerhead in your new-to-you Pitts Special, but you forgot to turn the smoke on. So, you fumble with the switch and take your concentration off the increasing torque as the aircraft slows. You feel a little more negative g than normal during the pivot; before you know it, the airplane ends up on its back, and it's spinning.

You're familiar and comfortable with upright spins, but this one is different — blood is rushing to your head, the cockpit is filling with smoke, and you're having a hard time figuring out which direction the airplane is spinning. You remember that some guy Beggs another guy named *Mueller* (admit it, that's funny) to give him the spin recovery technique for this exact situation, but you just can't remember what it was.

You wake up in a sweat, realizing it was just another one of those quirky aerobatic dreams you seem to have occasionally, but this time you make it a point to call someone to learn the ins and outs of these dreaded inverted spins.

At Gambit Aviation, we have a myriad of training programs ranging from simple tailwheel endorsements, Unlimited aerobatics, and Pitts Model 12 transition training to warbird training, but one of our favorites is the Advanced/Inverted Spin Series program.



Pitts Model 12.

Let's not be confused with the standard FAR 61.183(i) spin endorsement for flight instructor candidates, but it's also not a far cry from that one. This training is normally included in our Extra 330LX solo rental course, as well as the advanced aerobatics course, but we typically provide this training daily to aircraft owners in various types of aircraft, such as the Extra 200/300/330LX-LC-LT, Pitts S-2B/C, Pitts Model 12, Skybolt, Yak-52, and so on. Regardless, the information is all translatable, minus for a few specific types.

At our core, we train pilots to actually fly airplanes not only by the data provided by instrumentation but also by listening to what the airplane is telling you through the stick and rudder pedals. It sounds silly and obvious to people familiar with aerobatic aircraft and all-attitude flying, but it is a mark that is sorely missed in the training environment as we progress further toward the button pusher and further away from the well-rounded aviator.

Allow me to provide a little insight on our curriculum for the students looking to gain these new skills:

We begin the lesson with a discussion on the academics for upright spins and how they are



Inverted spin training is a functional skill set you will need sooner rather than later.

similar to inverted spins and how the aerodynamics for the former applies to the latter, especially so for an airplane with a symmetrical wing.

A refresher ranging from lift/drag curves, incipient trajectory aerodynamics, stability, and gyroscopic precession all the way to elevator blanking and mass distribution ensues before we dive into the fundamental differences of the inverted spin. Here we focus on reality — where the inverted spin event is not counted. Yet, as a maneuver that an aerobatic pilot adds to their immediate repertoire but more of a discovery of its somewhat unpredictable oscillatory modes and the extremely disorienting environment, they will find themselves in because of them.

We foster the realization that many inverted spin accidents occur due to a loss of orientation, and that much of the early stages of learning these spins consists of developing the ability to make accurate observations while in the maneuver that will lead to a successful recovery.

We use a build-up approach to it, which means the immediate goal is not perfection but rather a progression of experience and envelope expansion.

We spend a great deal of time, alongside this approach, refreshing the upright flat and accelerated spin modes while discussing the relationships between their inverted counterparts.

What many if not all of us already know is that, just because the wing is stalled, it does not mean that the flight controls no longer have any authority. The leftover available lift of the ailerons and elevator beyond the wings' critical angle of attack leaves one with enough control to manipulate where each wing sits on the respective lift/drag curve.

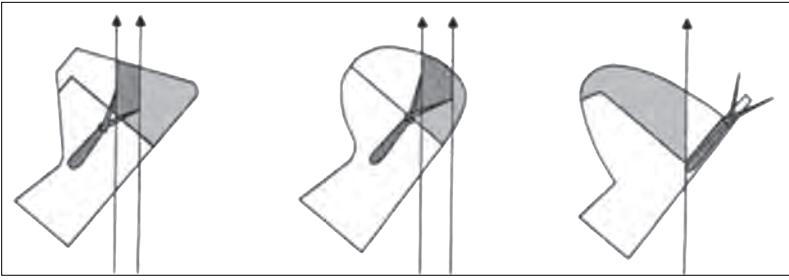
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Performing these flat and accelerated inverted spins ad nauseam is paramount for the sake of familiarization as most inadvertent inverted spins aren't established with the ailerons in the neutral position or the throttle at idle.

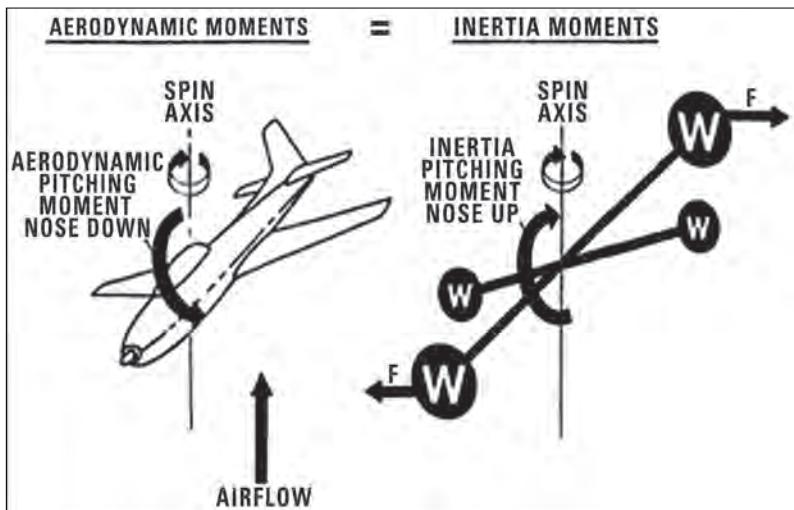
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Just as in an upright flat spin, the out-spin aileron (which is technically in-spin aileron because you're inverted) raises the inside wing, which creates a pitch-up "flattening" moment by bringing the engine and empennage closer into the plane of rotation, increasing inertia and decreasing the rate of rotation.

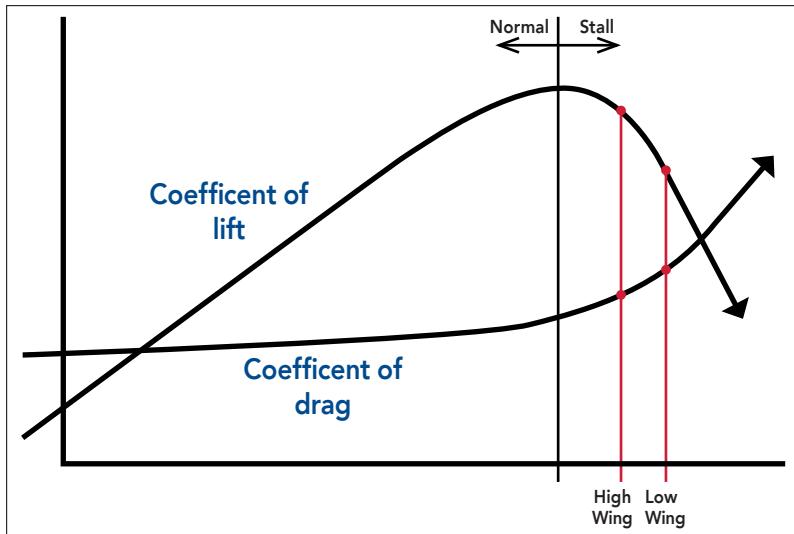
Likewise, just as in an upright accelerated spin, the pitch-down



Rudder blanking.



Upright spin illustration depicting nose-down and nose-up pitching moments.



Lift/drag curves.

moment reduces inertia, thereby increasing or accelerating" the rate of rotation. Clear as mud, right? Performing these flat and accelerated inverted spins ad nauseam is paramount for the sake of familiarization as most inadvertent inverted spins aren't established with the ailerons in the neutral position or the throttle at idle. A standard hammerhead is the exemplar, as the airplane is pivoted commonly with full power and outside aileron.

We teach not to attempt a recovery while within one of these modes but rather to return the aircraft back to its normal fully developed inverted spin state before resuming the normal recovery method. Not

If we use PARE (power to idle, ailerons to neutral, rudder opposite the spin, and elevator forward) for our inverted spin recovery where we unload the elevator at the end, then it is identical to the upright spin recovery, and the stick position will no longer be a point of uncertainty.

doing so, you are picking a battle against a large inertial moment that may take longer than normal to recover from, thus causing you to mistakenly believe your input is wholly ineffective. During the training process, we will have our students purposefully perform these ill-advised recovery methods for the sake of familiarity.

On the topic of recoveries, we often see a moment of confusion as we discuss the recovery method of the inverted spin as it compares to the upright spin. We broadly get answers that make logical sense as the student knows that an inverted spin is practically identical to an upright spin; just as we have a positive critical angle of attack, we also have a negative critical angle of attack. Therefore, the spin recovery must be the same, which is true, but there lies some hesitation.

Most pilots know that power goes to idle, the ailerons go neutral, the rudder goes opposite, and the elevator goes forward, but we often follow up with "How far forward?" The deer-in-headlights look starts when the student realizes that the stick is already forward during the spin, ahead of its turn in the recovery process. Exactly here is when we suggest changing the vocabulary to "unload" the elevator, rather than just pushing or pulling the stick to a predetermined position.

In other words, stop asking the wing to produce more lift. If we use PARE (power to idle, ailerons to neutral, rudder opposite the spin, and



We foster the realization that many inverted spin accidents occur due to a loss of orientation.

elevator forward) for our inverted spin recovery where we unload the elevator at the end, then it is identical to the upright spin recovery, and the stick position will no longer be a point of uncertainty. Done incorrectly, you risk remaining in the inverted spin longer than anticipated as you never allowed the wing to return to the flying side of its angle of attack curve.

Worse yet, we often see first-time inverted spinners revert to the “stick full forward” mindset during the inverted spin recovery and position the stick fully aft, placing themselves in an inverted accelerated spin, or a crossover spin; though, after the first flight, the biggest surprise to the student is the duration of the recovery stage, as the recovery will generally happen faster in an inverted spin due to the larger effective rudder area.

At the end of the ground lesson, we lay out the profile for the first flight in the program, which is purposely designed as a slightly overwhelming introduction. The goals for the student will determine which seat they sit in, although we prefer to put every student in the back seat of the Extra regardless of their time and chosen program. But that’s an entirely different conversation in and of itself. We aim to complete an orientation on inverted stalls, followed by two incipient inverted spins, two fully developed inverted spins, one inverted flat spin, and one inverted accelerated spin.

Here we are only looking for exposure to the aforementioned disorienting environment so that the student can operate out of the bounds of their envelope for a moment. And we anticipate that we return to the classroom with more questions than answers in the student’s head. The useful learning starts during the second flight as the helmet fire is extinguished and time starts slowing to a normal pace again.

For aerobic pilots, inverted spin training is arguably just as important as upright spin training is for the straight-and-level pilot who hopes to never see a

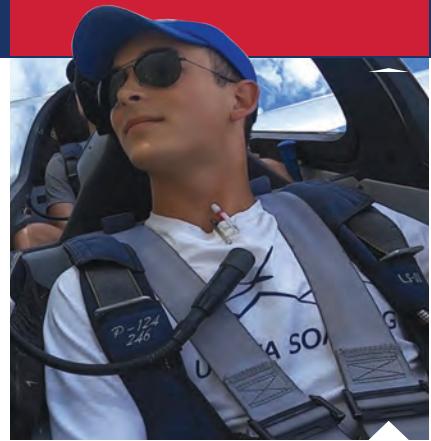
spin through their entire career. Whether for aerobatic competitors who need to do an inverted spin to a heading or for the owners out there who are just having fun, it is a functional skill set that you will absolutely be in need of sooner rather than later. So instead of the inverted spin waking you up from your next dream, let it become part of your aerobatic tool bag. **IAC***

Jared Sebesta is an accredited Master Certified Flight Instructor-Aerobatic (MCFI-A) at Gambit Aviation specializing in basic to unlimited aerobatics training, upset prevention and recovery (UPRT), loss of control in-flight (LOC-I), advanced spin series, radial engine and jet warbird training, high performance taildragger transition, and more. He has worked with the FAA on several extensive projects, developing Letters of Authorization and Deviation Authority on the PBY Catalina, Pitts Model 12, and Aero Vodochody AV-L29 Delfin to create ride and training programs, along with creating a solo rental program of an Extra 330LX. Jared’s other life is that of a chief pilot for a Part 91 Learjet operation.



Flying the 2024 Glider Sportsman Sequence

BY JARED R.S. BACHMAN, 2ND LT., USAF, IAC 440685



Introduction and Disclaimer

THIS ARTICLE PROVIDES GENERAL INFORMATION and techniques for flying the International Aerobatic Club's 2024 Sportsman Known Glider sequence. It is not intended to replace an aerobatic CFI or your pilot's operating handbook (POH).

There are a few concepts that impact the sequence overall that I will cover before discussing individual figures. These concepts involve entering the box and figure exit lines.

Box Entry

Unlike powered pilots, the aerobatic glider pilot is constantly losing altitude and should plan their box entry accordingly to best present to the judges. *IAC Rule Book*, Section 29.3.1, states that judges must consider "control of distance and altitude for best viewing angle" in their presentation scores. Additionally, Rule 27.15.1 states, "For each figure that cannot be properly graded because of viewing angle or distance, deduct 2 points."

Judges grade any line or looping segment relative to the horizon and the glider's flight path. If a judge cannot keep both the horizon and the aircraft's flight path in sight simultaneously, they cannot accurately grade the figure, resulting in a point deduction on the figure and overall presentation.

For example, if a pilot performs a loop orientated too close on the Y-axis to the judges, the judges are required to look up at a higher angle, lose sight of the horizon, and are unable to accurately judge the roundness of the loop.

Therefore, glider pilots should generally begin in the back third of the aerobatic box and work toward the judges as they descend to maintain a constant and comfortable viewing angle, as depicted by the green line in Illustration 1. It is better to err on the side of flying farther back in the box (yellow line)

than directly over the judges (red line) for presentation purposes.

Plan on entering the box in between the center and far edge of the box (away from the judges) to maintain the ideal viewing angle. If winds are pushing you toward the judges, start on the edge of the Y-axis to compensate. If winds are pushing you away from the judges, begin your sequence on the center box marker.

The Sportsman sequence includes two figures where the pilot turns onto the Y-axis. Strategies for these turns will be

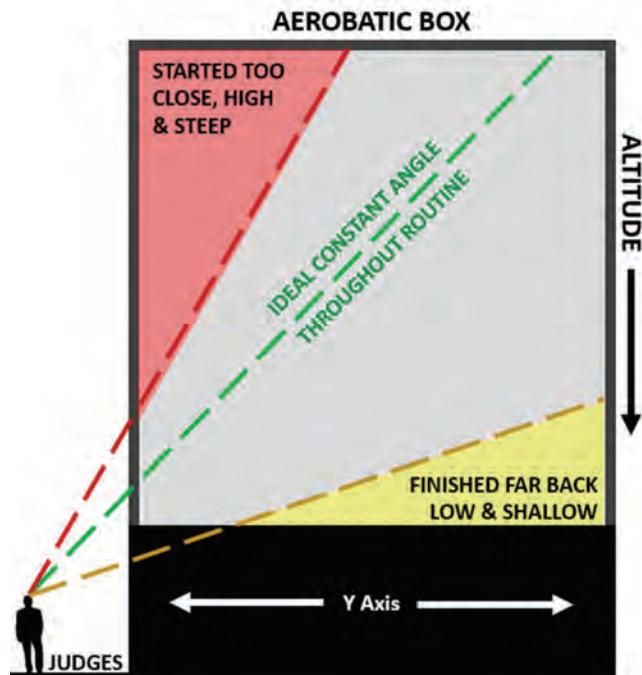


Illustration 1 – Angle to fly for judges' best view is indicated by the green line.

discussed later. Y-axis figures will generally be flown to keep the glider on the ideal viewing angle.

Figure Exit Lines

Aerobatic figures can be categorized into “fast” or “slow” entries and exits. For example, a competition spin requires a slow velocity at entry. Ideally, the figure before the spin should exit slowly. If the previous figure exits with a fast velocity (e.g., a loop), the pilot should plan on exiting on a slight upline to decrease airspeed and set up for the next maneuver.

Remember, Rule 34.19.2.1 states, “In Glider flights, the lines marking the entry into and exit from a maneuver can be at any reasonable angle and need not be the same, provided the angles do not violate the basic form of the figure.” This allows glider pilots to finish maneuvers on ascending or descending lines to ensure proper velocity for the succeeding figure.

Though figures can exit on reasonable lines, the line connecting figures must be constant. A pitch change in between figures will result in a point deduction. When chair flying your sequence, plan and practice figure exit lines — they are critical to safely and successfully flying any glider sequence!

Figure 1: The Loop

A loop can be divided into four 90-degree sections. (See Illustration 2.) The entry velocity and initial g-loading applied defines the shape of the first section, which the following sections should replicate. Airspeed and kinetic energy decrease as the glider climbs, which often causes glider loops to be tall and oval-shaped, with quadrant four ending significantly lower than quadrant one. Entering the loop at a high airspeed with high initial g-loading keeps the loop smaller, which makes mistakes less noticeable while preserving energy. For example, the DG-1000 POH specifies entering loops between 97-108 knots indicated airspeed (KIAS) and 4g. Experienced DG-1000 competitors target 120 knots indicated airspeed and a 4.5g entry in calm wind conditions. This step keeps the loop tighter and generally rounder while still flying within aircraft limits.

Less experienced pilots tend to roll to the right while pulling back on the control stick due to the natural path of movement of the right arm. This tendency is highlighted while flying loops. If the loop’s exit heading is left of the entry heading, right aileron was inadvertently applied at some point during the figure.

Just like a turn-around-a-point, a loop should be wind-corrected. G-loading should be highest when downwind due to the faster groundspeed and vice versa. In this sequence, the loop enters into the wind. Modifying g-loading

by +/- 0.5g is a good starting point — decrease g-loading by 0.5g on the initial pull in a headwind and increase by 0.5g on the pull between sections three and four to compensate for the tailwind. Remember, g-loading will naturally decrease as the aircraft enters section two. Do not attempt to maintain a constant g-loading to keep the loop round — the natural decrease in g’s and airspeed will already ensure it.

Start this figure centered on the X-axis in front of the judges and toward the rear of the box as appropriate for any crosswinds. Exit the loop on a slight downline. Figure 2 has a “fast” entry.

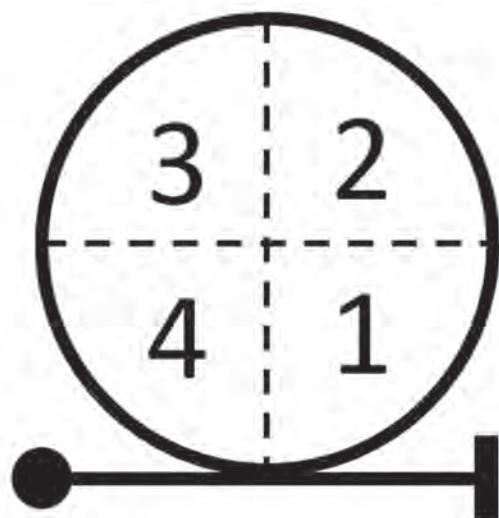


Illustration 2 - Four quarters in a loop.

Figure 2: The Half-Cuban

This figure can be divided into two parts: the looping portion and the 30-degree downline. The techniques for the looping portion of this figure mirror Figure 1. While transitioning from the loop to the 30-degree downline, the glider’s airspeed should be slow enough to allow the pilot to set a discernible line before and after the roll without overspeeding the glider on the downline. Reducing the g-load during the initial pull of the looping portion by as much as 0.5g - 1g will allow the glider to enter the downline at a slower airspeed. (See Illustration 3.) Omitting a line before/after the roll results in a sizable point deduction and is much easier for a judge to spot than a slightly out-of-line loop.

On the 30-degree downline, the half-roll must be centered on the line. Since the glider is increasing in airspeed throughout the duration of the line, the time spent on the 30-degree downline before and after the roll must differ to keep the length of each segment of the line the same. A good rule of

My intent is to provide general techniques for flying this sequence, not procedures applicable to your aircraft.

thumb for gliders is a 2-to-1 time ratio between the slower and faster portion of the line.

Proper aileron and rudder coordination is critical during the rolling portion of any figure. For example, if using left aileron during the half-roll, the pilot should apply right rudder for the first half of the roll (inverted to knife edge), followed by left rudder for the remainder of the roll.

Plan on exiting the figure “fast,” pulling to a slight downline in preparation for Figure 3.

Figure 4, the 1-1/4 spin, is a Y-axis maneuver and requires a decision on which way to spin. While exiting Figure 2, the pilot has an excellent view of the box and should consider which way to exit the spin on the Y-axis to best keep the glider on the ideal viewing angle.

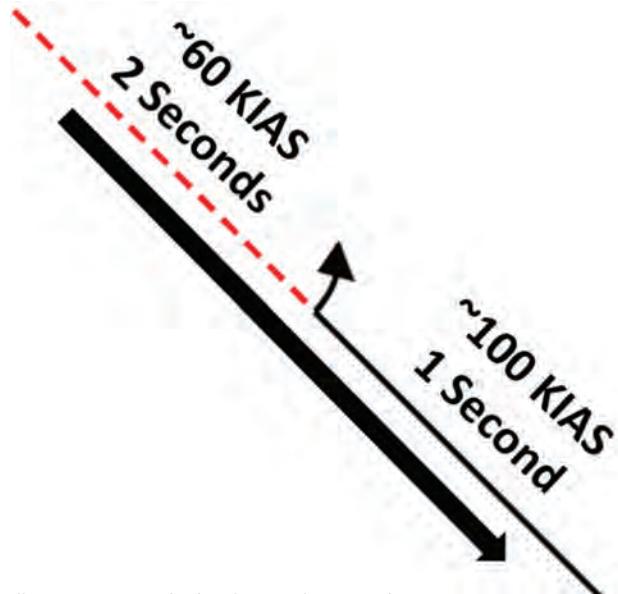


Illustration 3 – Enter the downline at a slower speed.

Figure 3: The Immelmann

Gliders are generally at a slow airspeed at the top of a loop. However, Figure 3 requires a higher airspeed at the top of the looping portion in order to have enough energy to accomplish the half-roll. It is a challenging figure, especially in slow-rolling gliders. To further add to the difficulty, the following figure requires a slow entry, meaning that Figure 3 should ideally exit on a shallow upline.

To maintain sufficient energy after the looping portion, begin the loop with a higher entry airspeed and maintain a constant g-load. Continue applying back-stick pressure throughout the looping portion to maintain the desired g-load. Plan on exiting the looping portion on a shallow inverted upline (approximately 10 degrees to 15 degrees).

Once a slight upline is achieved, neutralize the control stick and then begin your roll. If the pilot rolls with any inadvertent “up” elevator applied, the glider will change heading during the roll. Be sure to remain coordinated throughout the roll using techniques described in Figure 2.

Figure 4: The 1-1/4 Competition Spin

Begin the spin past the center box marker on the upwind side of the box. There may be a long line connecting Figure 3 and Figure 4 – this is a perfect opportunity to confirm which way to spin. This figure is the first in the sequence to exit on the Y-axis. Use this opportunity to compensate for any cross-wind effects and to maintain an optimal presentation angle as previously discussed. The direction of the spin chosen in Figure 4 decides the direction to roll in Figure 5. If spinning to the right, the pilot must roll to the left during Figure 5. A helpful technique is to verbalize it (“spinning right, rolling left” or vice versa) to maintain situational awareness.

During the entry of the figure, the aircraft must simultaneously move around all three axes: the nose pitches toward the ground, the glider yaws, and the wing will drop/roll. Pulling back abruptly to force the glider to stall prematurely or kicking the rudder to force a premature yaw will result in a point deduction.

Each glider’s spin characteristics differ. Practice when to begin applying anti-spin inputs so that the spin terminates on the desired heading. Before entering the spin, pick a visual reference point to prompt initiating spin recovery, usually 90 degrees to 120 degrees prior to the spin exit.

After the spin is terminated, the maneuver is still not over. Rule 28.24.8 directs that the glider must establish a vertical downline after the spin. This can be accomplished in two ways: blending spin recovery inputs to exit on a vertical downline or pitching to a vertical downline after recovering the spin separately. Pull to level on a slight downline – the next maneuver has a “fast” entry.

Figure 5: The Quarter Cloverleaf on an Upline

Before beginning this figure, consider how far the glider should continue flying on the Y-axis to best compensate for any crosswind effects and to maintain the ideal presentation angle.

This figure has two components: a simultaneous half-roll and half-loop up, followed by a simple half-loop down to exit on the X-axis. Remember, the glider must exit this maneuver

going the proper direction on the X-axis. Think back to what was verbalized during the spin (“spinning right, rolling left”). Before beginning the maneuver, find a visual reference point 90 degrees off — you should see this point halfway through the maneuver while inverted.

Begin applying rolling and looping control inputs together. The aircraft’s roll and pitch change must be simultaneous per IAC grading criteria. When the glider is inverted, the heading should have changed 90 degrees from the initial entry and you should see your reference point. Simply neutralize rolling inputs while maintaining back-stick to fly a half-loop down. The next maneuver has a “fast” entry; exit on a slight downline in preparation.

Figure 6: The Laydown Humpty

This one is a reversing figure and should not be started until the glider is downwind of the center box marker. This figure can be divided into three sections: a 30-degree upline with a half-roll to inverted, a half-loop, and a 30-degree downline.

Pull to a 30-degree upline, neutralize controls, and begin the roll (after an appropriate pause), being sure to remain coordinated throughout. If flying a glider with a slower roll

Each glider’s spin characteristics differ. Practice when to begin applying anti-spin inputs so that the spin terminates on the desired heading.

rate, it is possible to run out of energy during/immediately after the half-roll. In competition, maximum safe airspeed should be established prior to setting the upline. A firm initial pull will preserve kinetic energy.

The half-roll on the upline must be centered. Because the glider is flying fastest before the half-roll, plan on pausing longer after the half-roll to keep the roll centered on the upline. (See Illustration 4.)

Setting the 30-degree downline can be difficult. It is helpful to look over the shoulder while pulling to ensure the looping section stops on the 30-degree downline. Use a sighting device, canopy rail, or the leading edge of the wing relative to the horizon to terminate the half-loop accurately. Set the downline and prepare for the competition turn.

READY, SET, GO

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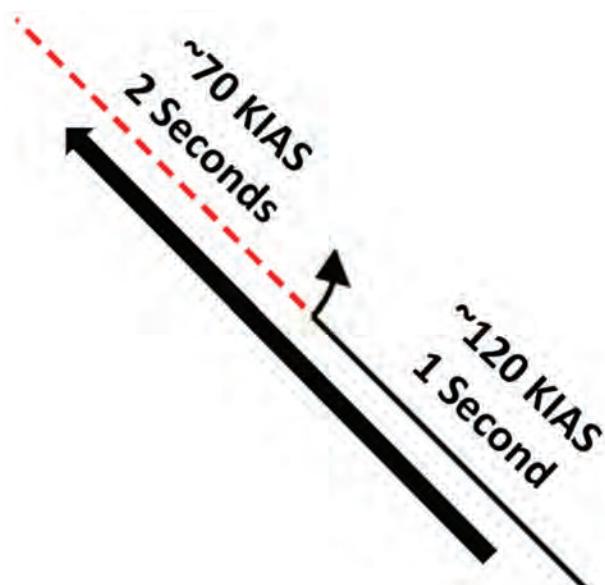


Illustration 4 – Pause longer after the half-roll to keep the roll centered.

Figure 7: The Competition Turn

It is the final opportunity to shift the glider on the Y-axis to maintain the ideal viewing angle. This maneuver also positions the glider on the X-axis for Figure 8, the full roll. Slower-rolling gliders should place the turn as far upwind as possible to ensure that Figure 8 downwind remains in the box.

Competition turns generally enter and exit at similar airspeeds. Therefore, ensure that you enter the turn at the appropriate pitch picture that Figure 8's full roll requires. For gliders, maintaining a steeper angle of bank (70 degrees to 85 degrees) mitigates any climbing tendencies with the application of back-stick and helps to maintain airspeed.

Competition turns are divided into three sections: establishing a bank of 60 degrees to 90 degrees, changing heading, and rolling back to wings level while maintaining the final heading. These three sections must be distinct; changing heading while still rolling into the turn will result in a point deduction for a “blended entry.” Roll to the desired angle of bank, neutralize the stick, apply back-stick to initiate the heading change, neutralize the stick to stop the heading change, and roll to wings level.

The g-loading applied during the heading change is generally between 1.5g and 3g. A higher g-load will decrease the turn's ground track and can be used to optimally position the aircraft in relation to the Y-axis.

Figure 8: The Aileron Roll

The aileron roll is the final maneuver in the sequence and will make a big impression on your overall presentation score. From the judge's perspective, the glider should roll at a constant rate without barreling or pitching. Ideally, the aircraft will be halfway through the roll while directly in front of the judges – begin rolling accordingly if able.

Newer aerobatic pilots tend to relax aileron inputs during full rolls. A helpful technique is to use both hands on the control stick to ensure that aileron input is not accidentally reduced. Stay coordinated throughout the roll. Refer to the concepts reviewed in Figure 2.

Unlike powered aircraft, gliders can descend during aileron rolls on a consistent and reasonable angle. If the glider's pitch is not ideal when exiting the competition turn, it is better to fix it before beginning the aileron roll at a slight point deduction. Do not enter the aileron roll on too steep of a downline; doing so could result in an overspeed.

Concluding Thoughts

This article is not airframe specific. The aerobatic glider community has a broad spectrum of airframe capabilities. A DG-1000 and MDM-1 Fox handle differently yet commonly compete in the Sportsman category. Therefore, my intent is to provide general techniques for flying this sequence, *not* procedures applicable to your aircraft. Specific entry procedures including airspeed and g-loading should come from your POH and respect any applicable airframe and personal limitations.

Always fly in accordance with your and your glider's personal limits. Never be afraid to wag out if you lose situational awareness or aren't positioned for the next figure. The penalty for doing so is negligible compared to flying a poor or incorrect figure. Fly safe! **IACF**

Second Lt. Jared R.S. Bachman is the evaluation liaison officer for the 94th Flying Training Squadron at the United States Air Force Academy in Colorado Springs, Colorado. He has been a member of the U.S. Air Force Aerobatic Glider Team since 2020. He started in Sportsman and advanced through Intermediate to the Advanced category. At the end of 2022, he transitioned to flying Sportsman Power in a Pitts Special S-1E.



Flying the 2024 Sportsman Power Sequence

BY GORDON PENNER, IAC 429704, THREE-TIME MASTER CFI-AEROBATIC, FAA GOLD SEAL CFI



WELCOME!

I love the Sportsman category in that it is the highest level at which you can really compete, and win, in a jack-of-all-trades aircraft. Also, the standard 10-hour aerobatic course given throughout the United States prepares one to just about 90 percent of the level of difficulty required for a Sportsman-level competition flight.

Looking at the 2024 Sportsman Known sequence, I take the point of view of the Decathlon or Citabria pilot. Like last year's, this sequence will be difficult for low-horsepower/high-drag aircraft that are hard to roll at low speed, such as a Citabria. Many of us aerobatic instructors and coaches are again recommending pilots schedule a break during the sequence, this time between figures 6 and 7.

In addition to ideas specific to this year's sequence, in the body of an expanded article on the IAC website (IAC.org/ Articles), we also talk about the big picture and strategic ideas that can be applied to flying any sequence. Strategic idea No. 4 is about taking a break.

Taking a Break

The Sportsman pilot must **mentally prepare themselves to take a break during a sequence**. Mathematically, it is better to take a break (and take the small penalty) than it is to fly a truncated maneuver that scores badly, or even becomes unsafe. A score for a badly flown maneuver, multiplied by the K-factor for that figure, hurts way worse than taking the penalty points for an interruption.

The same is true for taking an "out" penalty. The break penalty and the out penalty are the same in Sportsman (5 points each). That low penalty value for outs and breaks was intentionally designed into the category "way back when" to enhance learning and safety.

Sequence Analysis

U.S. National Intermediate aerobatic champion and IAC president emeritus Doug Bartlett held sequence analysis seminars in the past. He believed that a pilot should know approximately how much altitude gain or loss occurs in each maneuver.



Doug Bartlett

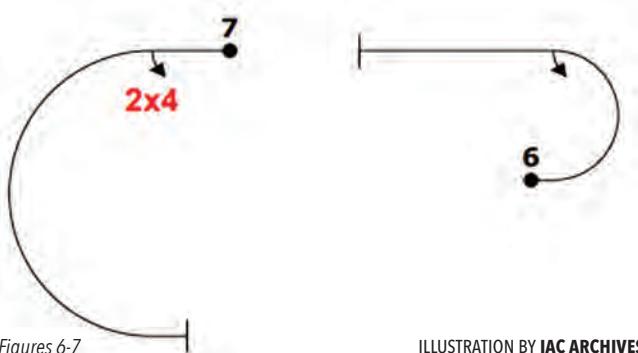
You could then use these numbers to analyze a sequence, starting from the last maneuver and working backward. This would allow you to know the minimum start altitude.

Now you know the beginning altitudes at key points in the sequence. For example, in this year's sequence it would be a good idea to know how high you need to be at the beginning of figure 7, the 2 of 4 with the half-loop down. Some call this point a "gate." Determine an altitude minimum for this gate, and **don't even think about beginning the maneuver** unless you are at your gate altitude or higher.

In the following example, I will do an analysis with some generic numbers. Let's say figure 7 will lose approximately 700 feet, and that you will lose 300 feet in figure 9, the half-Cuban-eight. Figures 8, 10, and 11 are level. That is 1,000 feet of altitude loss total.

Since the bottom altitude for Sportsman is 1,500 feet AGL, going backward from the gate altitude for beginning figure 7 is 2,500 feet AGL.

The key to this sequence, and the limiting factors overall, are figures 6 and 7.



Figures 6-7

ILLUSTRATION BY IAC ARCHIVES

When I was getting initial aerobatic training, we stayed in the middle of the speed range. When I started competing in the 150-hp Decathlon, I was told to get into the yellow arc as much as possible. They said the airplane presents so much better when flown faster, and they were right. My scores went up. Since I didn't have the horsepower, longer downlines facilitated my higher speeds and better standings.

Fly safe and have fun! **IAC**

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Judging Competition Turns

BY DJ MOLNY, JUDGES PROGRAM CHAIR, IAC 25097



Aerobatic Turns? Really?

AEROBATIC COMPETITION IS ALL ABOUT FLYING WITH PRECISION. Loops are easy, but good luck making them look perfectly round. Anyone can roll an airplane, but doing it at a constant rate while holding a constant altitude or attitude? You'll probably need lots of practice, critiquing, and 100LL to get consistently good scores.

Then there's the humble turn. Aspiring pilots start working on turns in their first lesson, initially focusing on coordination — keeping the ball in the middle — and maintaining altitude. As learners progress, they tackle more advanced challenges, like turns about a point. Important skills for sure, but probably not what our friends imagine when we slip aerobatics into yet another conversation.

Nonetheless, the founders of our sport devised rules for competition turns that are a good test of piloting ability and fairly easy to judge.

Phase 1: Roll In

Competition turns begin with a roll to at least 60 degrees of bank while holding a constant heading. Anything less than 60 degrees earns a deduction of 1 point per 5 degrees ("1-in-5"), and any heading change during the roll — called "blending" — is penalized the same way. I recommend a bank angle of 70 degrees to dispel any doubt.

Once the bank is established, the pilot may either pause momentarily or begin the heading change immediately. Although judges should be prepared for either case, I highly recommend a "one Mississippi" pause to avoid any perception of blending.

Phase 2: Heading Change

The rate of turn must remain constant during the heading change. Each variation is penalized either a half or a full point depending on the severity. Any change in the bank angle is subject to the 1-in-5 penalty.

Phase 3: Roll Out

This is the opposite of Phase 1: an optional but recommended pause, followed by a roll to wings-level. The 1-in-5 penalty applies to any under- or over-shoot of the final heading, blending during the rollout, and bank remaining after the roll out.

There's also a 1-point penalty if the rate of roll out doesn't match the rate of roll in. Most airplanes, especially gliders, will lose a bunch of airspeed in a prolonged high-g turn. If you use full aileron deflection in Phase 1, you won't be able to match that roll rate in Phase 3.

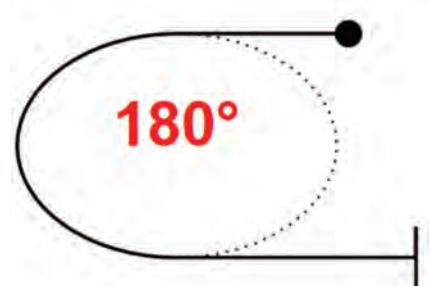
Holding Altitude

Unsurprisingly, altitude must remain constant throughout the figure. But the deductions are unusual: Judges can choose between 1 point per 100 feet or 1 point per 5 degrees of climb or descent. This lets us downgrade significant altitude changes as well as momentary pitch errors.

The distance between the aircraft and the judges line changes constantly throughout any turn. Judges must not confuse the ever-changing viewing angle for genuine altitude changes.

Turning (While) Upside Down

Every upright turn in the Aresti catalog has a corresponding inverted turn. The scoring criteria are exactly the same, even though inverted turns feel different in the cockpit.



180-degree competition turn.

As always, judges must ignore the difficulty of the figure. If you find yourself giving out lots of 9s for upright turns versus 6s for inverted turns, so be it.

Strategy

Phase 2 need not be a coordinated turn. The pilot may use a turn rate that reduces or increases the radius to help with positioning, either to avoid a boundary penalty or to serve as a wind corrector. And of course, airspeed has a big effect on any turn radius.

An upright 90-degree turn is worth a mere 3K, while an inverted 360 is 8K. Pilots occasionally descend to gain speed or climb to gain altitude during a turn because there aren't many points at stake. As judges, your job is simply to grade what you see. It's up to the chief judge to decide if the competitor is deliberately climbing or descending and, if so, award an implicit interruption penalty.

Next Up: Rolling Turns

Rollers bring a new set of judging challenges, which we'll cover in the next installment. Meanwhile, I wish everyone a happy, healthy, and productive new year and look forward to seeing lots of you at upcoming IAC events. **IAC**

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**Remember,
things don't always go
according to plan!**



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