

**SPORT**

MAY 2018

# **Aerobatics**

OFFICIAL MAGAZINE of the INTERNATIONAL AEROBATIC CLUB



FLYING THE 2018 SPORTSMAN ◀

SNOWBIRD CLASSIC ◀

ADS-B ◀



ORIGINS OF THE  
**One  
Design**



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5 days.  
23 hours.  
40 minutes.  
And 15 seconds  
of saying  
to yourself,  
“One day  
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to pick up  
a camera  
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## COVER

Dan Rihn's seventh aircraft design, the prototype DR-107 One Design, first took to the air in 1993.

Photo by Budd Davisson

## Preregistration Concern

**THE NUMBER ONE COMPLAINT** for the last two years is no preregistration for contests. *Why?????????* The fix can't be that complicated. It's a terrible burden on the registrars, and if we know who's going, can make arrangements for sharing rental cars, etc.

**BILL MCLEAN**, IAC 434875  
 DALEVILLE, ALABAMA

Dear Bill,

*Unfortunately, the fix is that complicated. The contest registration system must communicate with the website, the contest database, and the contest scoring system. These three resources are managed by three volunteers because the they are so complex. A fourth volunteer has been brought on to write the new contest registration system. Unless the work is done carefully and as a team, the result not only will not work, but it will break the existing functionality. Like all volunteers, we have limited time to donate. Unlike all volunteers, the expertise we need is specialized and scarce. Thus, as a resource limited process, it is a rate limited process. I assure you that we are on it. Please be patient with us.*

Thank you very much,  
 Tom Myers, Chair, IAC Tech Committee **IAC**

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# The Rewards of Spring

BY ROBERT ARMSTRONG, IAC 6712, IAC PRESIDENT

**SPRING IS REWARDING** us for being patient all winter. The official sign of spring for aerobatics enthusiasts is the first contest flying of the season. Events to start our contest season have kicked off in Florida and California with Texas and North Carolina close behind. Results will be seen on the IAC website under the tab Competition/Chapter Contests/Results.

With the flying activities returning to our calendar, now is a good time to remind everyone that this does not happen by magic. We are a worldwide organization comprising a unique part of the population that has an interest in a very special form of flying. The success of any event depends on people. In our sport these are all volunteers, many of whom are never seen. Many hours of planning are required for the execution of these tasks to make this happen so all can enjoy a few days of aerobatic flying.

The IAC works so well as a direct result of many members giving countless hours of time to us all. The IAC operates through elected executive officers, directors, and an executive director, all of whom every member can communicate with. The real work is in the background on the many committees that form the backbone of our organization. Without these committee members' service we may not enjoy some important things like judges, rules, contest results, and even the waived airspace we enjoy. These members are a very small part of the group, but all perform a vital role. In the future it will be very encouraging to have more members join us in some of these activities and help mold the way the IAC is run.

**"FOR THE FUTURE I WOULD LIKE FOR MEMBERS TO REFLECT ON THEIR PAST, TO RECALL WHAT BROUGHT THEM TO THE IAC."**

We now have a committee conducting a review of the IAC's policies and procedures document, commonly referred to as the P&P. This is a large volume that covers the way the IAC conducts business in all matters not covered in the bylaws and general rulebook. Some sections are out of date, and others are no longer relevant.

For the future I would like for members to reflect on their past, to recall what brought them to the IAC, and what has kept them interested. This reflection should provide us some guidance as to how to proceed with our organization and how to attract new aerobatics enthusiasts. Call or write to your regional director, to your chapter president, to our editor, or to me. Whichever route you take, your IAC will be better for it.

Let us all fly safe — and make it fun. **IAC+**

▶ Please send your comments, questions, or suggestions to [president@iac.org](mailto:president@iac.org).

▶ TOP STORY



Doug Bartlett with his Sukhoi SU-29.

## Doug Bartlett Appointed IAC Vice President

**DURING A TELEPHONE** conference on Tuesday, April 10, 2018, the IAC board of directors appointed Doug Bartlett, IAC 431228, as the new IAC vice president to fill out the remainder of Robert Armstrong’s term, which runs until July 2019. The vacancy was created when Robert was appointed to fill the IAC president position following Mike Heuer’s resignation at the IAC board of directors meeting on March 17, 2018.

Doug has been a member of the IAC since 2003. At the local level his IAC activities were in support of IAC Chapter 1 in Illinois, serving as contest director and chapter president. At the national level he has served on the government relations committee, on the executive committee, as treasurer (2006-2009), and as IAC president (2009-2012).

## 2020 FAI WORLD AIR GAMES TO BE HELD IN TURKEY

**TURKEY HAS BEEN** named the host country for the 2020 FAI World Air Games (WAG). The scheduled events include aerobatics, aeromodelling, drone racing, gliding, indoor skydiving, and paragliding – each attracting the world’s top athletes in those fields. The United States’ Rob Holland, IAC 27724, and Eric Lentz-Gauthier, IAC 432915, competed at the 2015 WAG in Dubai, in power and glider aerobatics, respectively.

The event, which showcases air sports to the general public and attracts new participants, has been running since 1997, previously taking place in Turkey (1997), Spain (2001), Italy (2009), and Dubai, United Arab Emirates (2015).

“A longstanding FAI member, Turkey has a lot of experience in organizing air sports competitions, not least the very first FAI World Air Games in 1997,” said FAI President Frits Brink. “I feel confident that they will put on a fabulous show for the World Air Games – the biggest and most exciting event on the FAI calendar.”



## VINTAGE AEROBATIC WORLD CHAMPIONSHIP 2018 ANNOUNCED

**FOLLOWING A SUCCESSFUL** 2017 event, organizers of the Vintage Aerobatic World Championships (VAWC) have announced plans for its return for 2018, to be held at Skive Airport (SQW), Denmark, August 16-19, 2018.

To create even more fun and social energy, competition will now be held in three categories: Vintage – planes built before 1955; Classic – planes built between 1955 and 1970; and Replicas – plans built

aircraft such as Bücker, Stampe, and Fokker. Each category will fly three Known programs: Looping the Loop, Dancing the Cloverleaf, and Rolling the Circle. A special “The Performance” program will feature graceful solo and team aerobatics choreographed to music, similar to the traditional 4-Minute Freestyle.

For more information, or to get involved, check out [www.VintageAerobatic.com](http://www.VintageAerobatic.com).





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## IAC MEMBERS HONORED WITH 2018 NATIONAL GA AWARDS

**DAN CHRISTMAN**, IAC 439136, of Las Vegas, Nevada, and Catherine Cavagnaro, IAC 430715, of Sewanee, Tennessee, were announced in February as 2018 National GA Award honorees. Dan and Catherine were awarded respectively as Certificated Flight Instructor of the Year and FAA Safety Team Representative of the Year.

The FAA will present the awards in July during EAA AirVenture 2018 in Oshkosh, Wisconsin. The recipients' names will be added to the large, perpetual plaque located in the lobby of the EAA Aviation Museum.

Congratulations to both on this fine achievement!



Dan Christman



Catherine Cavagnaro

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## INTRODUCING THE TEXAS CHAMPIONSHIP SERIES

BY DOUG JENKINS, IAC 436255

**MAYBE YOU THINK** you are the best aerobatic pilot in Texas. Or, maybe you think you can beat the best aerobatic pilots in Texas. Either way, as we say in Texas, come and prove it. The Texas chapters of IAC are inaugurating the *Texas Championship Series* as part of the 2018 contest season. The series will crown the best pilot in every contest category based on contests held in the Lone Star State.

To be considered for the title of Champion of Texas a pilot must fly in the same category in each of the three multi-category contests held in Texas: The Early Bird, April 27-28; The Lone Star Aerobatic Championship, June 22-24; and The Texas Hill Country Hammerfest, October 12-13. Easy.

The winner will earn bragging rights and a certain-to-be-coveted award suitable for his or her fireplace mantel. Please join us in Texas this season. If you have any questions about The Texas Championship Series, please contact Doug Jenkins at [bagsf15@yahoo.com](mailto:bagsf15@yahoo.com). Fly Fun!

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## NON-FLYING AWARD NOMINATIONS OPEN

**SHE GIVES COUNTLESS** hours of her personal time for the betterment of IAC. He volunteered many hours mentoring and coaching behind the scenes. She has a firm understanding of all aspects of judging. His products have made a tremendous difference to aerobatics.

Do these people sound like someone you know and whom you'd like to recognize for their contribution to the sport of aerobatics? Nominate him or her for one of IAC's non-flying awards:

- **Kathy Jaffe Volunteer Award**  
for outstanding volunteerism.

- **Robert L. Heuer Award**  
for judging excellence.
- **Harold E. Neumann Award**  
for outstanding chief judge.
- **Curtis Pitts Memorial Trophy**  
for outstanding product design.
- **Frank Price Cup**  
for outstanding contribution to the sport of aerobatics.

Complete descriptions and criteria of the awards, along with an online nomination form, can be found at [www.IAC.org/legacy/non-flying-awards](http://www.IAC.org/legacy/non-flying-awards).



Kathy Jaffe Volunteer Award

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## CLISHAM TO EMCEE U.S. NATIONALS AWARDS CEREMONY

**MR. HOLLYWOOD HIMSELF**, Danny Clisham, has accepted IAC's invitation to serve as master of ceremonies for the 2018 U.S. National Aerobatic Championships awards ceremonies. Danny is one of America's most beloved air show announcers, earning his nickname through his unique showmanship presentation and narration style.

Since he first picked up the microphone as a young man in 1965, Danny has announced thousands of air shows and aviation ceremonies. He has an encyclopedic knowledge of aviation, aerobatics, and its

personalities, as well as a devotion to aerobatic history and traditions.

A member of the Screen Actors Guild, he is a talented actor and pilot, using his talents for on-screen and voice-over work. He also has served as an aerial stunt coordinator, stunt double, and safety advisor for feature films and hit TV shows. He holds many awards for his work, including the ICAS Sword of Excellence and the Art Scholl Memorial Showmanship Award, and is an Air Show Hall of Fame inductee.

The Nationals awards ceremony and banquet will be held on Friday,



Danny Clisham

September 28, 2018, at the EAA Aviation Museum Founders' Wing in Oshkosh, Wisconsin.

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## Scholarship Application Deadline Approaching

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**THE IAC CP AVIATION EMERGENCY MANEUVER TRAINING SCHOLARSHIP IN MEMORY OF VICKI CRUSE** aims to promote aviation safety through unusual attitude and aerobatic training. The scholarship includes three modules of the EMT course: Stall/Spin Awareness, In-Flight Emergencies, and Basic Aerobatics. The course will be taught in a Citabria and Decathlon. The recipient must be a member of IAC and hold a private pilot certificate.

CP Aviation is a family-owned business located in Santa Paula, California, and currently maintains a fleet of aerobatic airplanes ranging from a Citabria to a Pitts S-2B, and numerous Cessnas. CP is also home to Judy Phelps, Master CFI-Aerobatic instructor and the 2011 National Flight Instructor of the Year. For more information about CP Aviation, please visit [www.CPAviation.com](http://www.CPAviation.com).

**THE GREG KOONTZ AIRSHOWS AEROBATIC INSTRUCTOR SCHOLARSHIP IN MEMORY OF BOBBY YOUNKIN** is targeted at those certificated flight instructors who have some tangible experience in aerobatics and have demonstrated by their activities that they are interested in becoming involved in aerobatic instruction. A current instructor certificate and a need for the financial support provided by this program are required at the time of the award. The recipient also must be a CFI with some tangible experience in aerobatics.

The scholarship consists of an eight-flight training program at Greg Koontz Aerobatics. All required ground school is included, as well as four nights' stay at Sky Country Lodge with its all-inclusive accommodations. The recipient will only be responsible for travel to and from the school.

Download all application forms from [www.IAC.org](http://www.IAC.org). Follow the submission instructions on the application form carefully and return the completed applications to [iac@eaa.org](mailto:iac@eaa.org). Applications received by June 30 are considered for this year's award.

The recipients of the three scholarships will be announced at EAA AirVenture Oshkosh in July, and if the recipient is present, he or she will be introduced at the IAC Gathering of Members.

**THE DOUGLAS YOST MEMORIAL AEROBATIC SCHOLARSHIP GRANT** is administered by IAC Chapter 78. The scholarship is named for an aspiring young career pilot who worked as a corporate pilot and was also an aerobatic pilot who was a rising star in aerobatic competition. The purpose of the scholarship is to promote aviation safety through aerobatic training. The recipient of this scholarship will receive \$2,000 in the form of a check made payable to the aerobatic school where the recipient will be training. Training must be conducted at a facility approved by the Chapter 78 scholarship committee, and training must be completed within a year of receiving the grant.

The successful scholarship applicant must be well rounded, involved in school and community activities as well as in aviation. The applicant's academic record should demonstrate that he or she could successfully complete the educational portion of aerobatic training. Flight instructor comment reports or letters of recommendation must indicate that the successful applicant has the basic flying skills and potential to benefit from this type of training.

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## CALL FOR RULES PROPOSALS

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**AS AN IAC MEMBER**, you are encouraged to submit rules proposals to the IAC Rules Committee. July 1, 2018, is the deadline to submit proposed contest rules or changes for the 2019 contest year. The rules committee will meet after this deadline and publish its recommendations to the

membership for comment. The IAC board of directors will then vote on each proposal at the fall IAC board meeting.

Submit your proposals at [www.IAC.org/propose-rule-change](http://www.IAC.org/propose-rule-change) and send a copy to the rules committee chairman at [BK@newattaero.com](mailto:BK@newattaero.com). **IAC**



# CALENDAR

- APR 05 Snowbird Classic • Chapter 89 • X35: Marion County Airport, Dunnellon, FL
- APR 13 Hammerhead Roundup • Chapter 36 • L08: Borrego Valley Airport, Borrego Springs, CA
- APR 27 Carolina Boogie • Chapter 19 • W03: Wilson Industrial Air Center Airport, Wilson, NC
- APR 27 Early Bird 2018 • Chapter 25 • 26R: Jackson County Airport, Edna, TX
- MAY 03 Sebring 77 • Chapter 23 • SEF: Sebring Regional Airport, Sebring, FL
- MAY 04 Duel in the Desert • Chapter 49 • KAPV: Apple Valley Airport, Apple Valley, CA
- MAY 19 2018 Wildwood Acroblast • Chapter 58 • KWWD: Cape May County Airport, Wildwood, NJ
- JUN 01 Ben Lowell Aerial Confrontation & 2018 IAC West Open Championship  
Chapter 12 • KFMM: Fort Morgan Municipal Airport, Fort Morgan, CO
- JUN 01 Coalinga Western Showdown • Chapter 38 • C80: New Coalinga Municipal Airport, Coalinga, CA
- JUN 08 Bear Creek Bash 2018 • Chapter 3 • KRMG: Richard B. Russell Regional Airport, Rome, GA
- JUN 09 Giles Henderson Memorial Challenge • Chapter 61 • SLO: Salem-Leckrone Airport, Salem, IL
- JUN 15 **CANCELED** Ohio Aerobatic Open • Chapter 34 • KEDJ: Bellefontaine Regional Airport, Bellefontaine, OH
- JUN 16 Flagstaff Regional Contest • AC Chapter 7 • CEK6: Flagstaff Regional Airport, Killam, AB, Canada

- JUN 22 Apple Cup • Chapter 67 • KEPH: Ephrata Municipal Airport, Ephrata, WA
- JUN 22 Lone Star Aerobatic Championships • Chapter 24 • KGYI: North Texas Regional Airport, Sherman, TX
- JUL 13 Green Mountain Aerobatics Contest • Chapter 35 • KVSF: Hartness State Airport, Springfield, VT
- JUL 13 High Planes Hotpoxia Fest • Chapter 12 • KSTK: Sterling Municipal Airport, Sterling, CO
- JUL 13 The Corvallis Corkscrew • Chapter 77 • KCVO: Corvallis Municipal Airport, Corvallis, OR
- JUL 14 Michigan Aerobatic Open • Chapter 88 • 3CM: James Clements Municipal Airport, Bay City, MI
- JUL 14 Super D Tango • Chapter 24 • XA68: Akroville Airport, Slidell, TX
- AUG 04 Doug Yost Challenge • Chapter 78 • KSPW: Spencer Municipal Airport, Spencer, IA
- AUG 10 Can-Am Championship • Chapter 67 • KCTB: Cut Bank International Airport, Cut Bank, MT
- AUG 17 Kathy Jaffe Challenge • Chapter 52 • KVAY: South Jersey Regional Airport, Mount Holly, NJ
- AUG 17 Upper Canada Open • AC Chapter 3 • CYHS: Hanover Saugeen Municipal Airport, Hanover, ON Canada
- SEP 01 ¡Viva Santa Maria! • Chapter 26 • KSMX: Santa Maria Public Airport, Santa Maria, CA
- SEP 08 Apple Turnover • Chapter 67 • KEPH: Ephrata Municipal Airport, Ephrata, WA
- SEP 08 ACE's High Aerobatic Contest • Chapter 119 • KEWK: Newton City/County Airport, Newton, KS
- SEP 08 East Coast Aerobatic Contest • Chapter 11 • KHWY: Warrenton-Fauquier Airport, Warrenton, VA
- SEP 22 U.S. National Aerobatic Championships • KOSH: Wittman Regional Airport, Oshkosh, WI
- OCT 06 The Clyde Cable Rocky Mountain Aerobatic Contest • Chapter 5 • KLAA: Lamar Municipal Airport, Lamar, CO
- OCT 12 Texas Hill Country Hammerfest • Chapter 107 • KAQO: Llano Municipal Airport, Llano, TX
- OCT 19 Akrofest • Chapter 36 • L08: Borrego Valley Airport, Borrego Springs, CA
- OCT 19 Mason-Dixon Clash • Chapter 19 • KFVX: Farmville Regional Airport, Farmville, VA
- OCT 19 Phil Schacht Fly Like Your Hair is on Fire • Chapter 288 • 42J: Keystone Airpark, Keystone Heights, FL
- NOV 01 Sebring 78 • Chapter 23 • SEF: Sebring Regional Airport, Sebring, FL
- NOV 01 The Tequila Cup • Chapter 62 • AVQ: Marana Regional Airport, Marana, AZ

# 2018 AEROBATIC CONTEST CALENDAR

Roll with us. Join the International Aerobatic Club through your local chapter, or at [www.IAC.org](http://www.IAC.org)  
For the most up-to-date contest listing, visit [www.IAC.org/contests](http://www.IAC.org/contests)

2018 US Advanced Aerobatic Team pilot A.J. Wilder  
Poster design and photo by Evan Peers. © Airspace Media & International Aerobatic Club, Inc.





# 2018 U.S. Nationals Update

BY JOHN SMUTNY, IAC 25010, CONTEST DIRECTOR

**THE PLAYBOOK FOR** the 2018 U.S. National Aerobatic Championships opened in earnest in March when the IAC board of directors met in Oshkosh for its spring meeting. I took the opportunity to fly out to Oshkosh to bring the board up to speed on where we are and where we are headed, and to meet with some of the major players from local and national government, EAA, and Oshkosh community groups.

The series of meetings started off with the Oshkosh tower staff since the contest last year had issues with aircraft movements. We discussed at length what the challenges were, and I listened to their ideas for smoothing out the process. They have some good thoughts, and everyone is looking forward to enhancing the aircraft flow to work for everyone.

Next, I sat down with our FAA inspector in charge from the Milwaukee FSDO. We reviewed last year's waiver and discussed some ideas for 2018. A significant change we are looking into is applying for a temporary flight restriction for each contest day. Using a TFR does *not* prohibit transient aircraft from operating in and out of the airport — they will still have that freedom. What it *does* provide is the opportunity to give competition pilots priority handling and reduce congestion.

A meeting with the airport administration was also very positive. They are eager to support the U.S. Nationals and are willing to discuss some new ideas and processes to accommodate the fast pace needed during the contest.

There will be a lot of work done in the coming weeks to work out the details on the traffic procedures, the NOTAM for practice days, and a TFR. All of the players in these discussions now are on the same page, and we're looking forward to working together to make a smooth-running contest a reality.

Meetings with EAA also confirmed a commitment to support the IAC and help wherever possible to improve the U.S. Nationals experience for competitors and volunteers. We all learned a lot in 2017 and are committed to making 2018 *the* best U.S. Nationals we've had.



In early April, the key volunteer group (KVG) met for its first conference call to kick off the planning process. There are still a few key areas that need filling, and those will be completed by late spring. Without these volunteers — some of whom are veterans to the process while others are new — there would be no chance of operating an event the size of the U.S. Nationals. Please extend a hearty thank you when you see them:

John Smutny, contest director; Mike Heuer, assistant contest director; Lorrie Penner, assistant contest director; Liza Weaver, registrar; Bob Meyer, jury chairman; Wes Liu, judges coordinator; John Willkomm, boundary judge coordinator; Alice Johnson, volunteer coordinator; Brittany Nielsen, communications; Gary DeBaun, starter and chief tech monitor; Mark Matticola, glider ops; Forrest Fox, videographer; Evan Peers, photographer; Amanda Brautigam, hospitality; Livy Phillip, program book.

See you in Oshkosh this September! **IAC**

**"WE ALL LEARNED  
A LOT IN 2017 AND  
ARE COMMITTED  
TO MAKING 2018  
THE BEST  
U.S. NATIONALS  
WE'VE HAD."**





2017

**ONE DESIGN DR-107**  
**ACRO SPORT**

IAC PAVILION AT AIRVENTURE  
JULY 23-29, 2018



EXHIBITION PRESENTED BY **IAGT**  
WITH HELP FROM OUR SPONSOR  
 **EXTRA AEROBATIC PLANES**



# What Aerobatic Pilots Need to Know About ADS-B

BY DAVID HUGHES, FAA WRITER



**THE FAA WILL** require pilots who are practicing aerobatics, performing in an air show, or competing in an event to report their positions via automatic dependent surveillance-broadcast (ADS-B) “out,” just as the agency currently requires an operating transponder.

The agency understands that ADS-B avionics performance will be reduced during aerobatic maneuvers due to GPS signal drops associated with antenna masking and other issues. But aerobatic aircraft should meet ADS-B equipment performance requirements when not engaged in aerobatics — such as during cross-country flights to perform in the next air show or competition, or en route to a practice area after takeoff. The FAA maintains that the ability of controllers and other pilots to identify and track aerobatic aircraft via ADS-B will enhance safety.

The FAA is interested in having aerobatic pilots enjoy ADS-B benefits when flying to or from air shows or other events, or to aerobatic practice areas (APA). According to Sue Gardner, the agency’s national aviation events specialist, the FAA has three messages for the community of aerobatic pilots:

1. ADS-B equipment will experience reduced performance during aerobatic maneuvers, and the FAA will not penalize any pilot in that situation. ADS-B equipment is expected to meet established performance requirements during non-aerobatic maneuvering.
2. ADS-B “out” is valuable for safety when an aerobatic aircraft is not performing dynamic maneuvers. It will transmit an aircraft’s identity and position to controllers and pilots of other aircraft equipped with ADS-B “in,” even if their aircraft is not being tracked on radar. ADS-B “out” will be required in most controlled airspace as of January 1, 2020.
3. Equipping with ADS-B “out” and “in” will help pilots of aerobatic aircraft travel safely to and from events.

With lightweight ADS-B avionics available, more aerobatic aircraft owners are recognizing the value of equipping with ADS-B to enhance safety. Some systems combine ADS-B “out” and “in” into one unit.

Steve Johnson, an aerobatic competition pilot who previously served as safety director for the International Aerobatic Club, said ADS-B can help pilots avoid unsafe situations. He flies a lightweight MX2 experimental aircraft powered by a custom-built 330-hp engine.

Steve Johnson



## INTERACTIVE ADS-B AIRSPACE MAP

Download the Equip ADS-B Google Earth map (KMZ) at [www.FAA.gov/nextgen/equipadsb/research/airspace](http://www.FAA.gov/nextgen/equipadsb/research/airspace) to look at the location of ADS-B rule airspace at your home base and where you fly. Pan and zoom to different locations and turn on the various capabilities of the map, including:

- Three-dimensional depictions of rule airspace, airports, and temporary flight restrictions in real time
- Overlays of ADS-B surveillance coverage — airspace where ATC can see aircraft transmitting ADS-B “out” information at altitudes of 500’, 1,500’, 3,000’, 5,000’, and 10,000’ AGL
- Non-radar airspace where aircraft transmitting ADS-B can be seen by ATC

Need help? Watch the Google Earth demo video at [www.FAA.gov/tv/?mediald=1207](http://www.FAA.gov/tv/?mediald=1207) for how to download and view the Equip ADS-B Google Earth map.

Steve did his own installation of ADS-B “out” on his aircraft, which cost \$2,000 after the \$500 FAA rebate. He watches weather and traffic using ADS-B “in” on his iPad, which he carries on cross-country flights. ADS-B “in” alerts him to other aircraft he didn’t know were flying nearby. It also helps him spot the traffic pointed out by controllers and determine how fast other aircraft are moving relative to his aircraft, which cruises at 170 knots. At that speed, Steve said “things happen quickly.” He also likes using ADS-B “in” to spot traffic in the pattern when flying into an unfamiliar airport for a refueling stop.

Steve finds ADS-B “in” weather helpful for strategic planning, looking at storms and weather 100 to 300 miles ahead of his aircraft. He uses a subscription weather service for closer-in views. Steve pays careful attention to staying in visual conditions all the time. He is an instrument-rated pilot, but his aircraft is only equipped for VFR flight.

“ADS-B is another tool in the arsenal of an aerobatic pilot, which keeps us safe when flying to and from contests and air shows,” he said. He logs more hours on the cross-country flights than he does in the events. Steve flies in about eight competitions annually and has placed first in regionals and second in nationals.

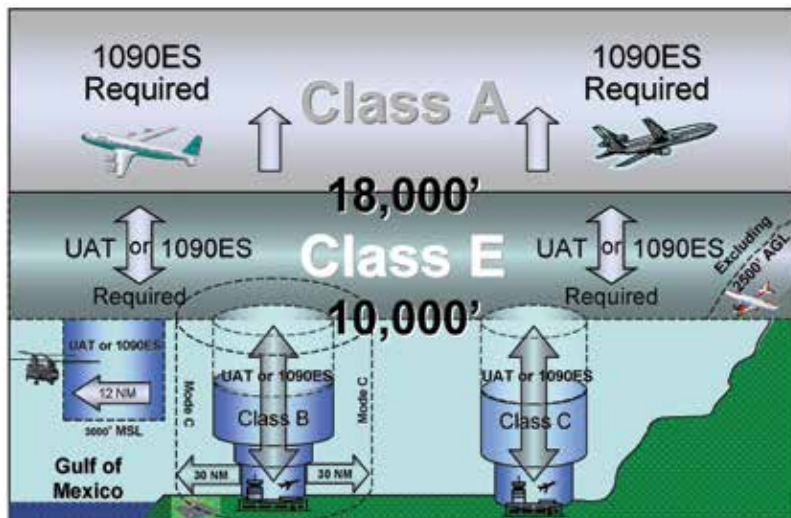
If aerobatic pilots fly aircraft equipped with optional ADS-B “in,” they can glance at a screen whenever they are flying to and from aerobatic practice areas, or to other airports, and see if other aircraft are nearby. In some cases, ADS-B “in” aircraft displays have saved the lives of general aviation pilots in flight by alerting them to another aircraft on a collision course.

Tom Haines, then editor of *AOPA Pilot* magazine who is now AOPA senior vice president of media and outreach, was flying under the hood in 2014 in his Bonanza with an instructor pilot when he heard a warning of an approaching aircraft. The instructor pilot spotted the other aircraft just in time and told Haines to climb, thus avoiding what Tom said was a probable midair collision.

In an example where ADS-B “out” and “in” would have helped, a pilot practicing aerobatics with a Grumman F8F Bearcat experienced a close call with a Canadair Regional Jet (CRJ). The CRJ pilots didn’t spot the Bearcat. The warbird’s transponder was off, and it was not equipped with ADS-B “out.” Fortunately, the pilot spotted the CRJ passing through the aerobatic practice area and maneuvered to avoid the passenger jet. The two aircraft avoided a collision, but it was a close call. The aerobatic area was listed in a notice to airmen, but the information had not registered with the airline or the CRJ crew. The safety observer on the ground did not spot the CRJ soon enough to call out the traffic to the Bearcat pilot.

The FAA has developed policy and advisory circular (AC) guidance for aerobatic pilots on ADS-B. There soon will be a new aviation-events policy in the FAA’s Flight Standards Information Management System created by Order 8900.1 and the new AC 91-45D, *Waivers: Aviation Events*. The policy was scheduled for publication in April and the AC is scheduled for this summer.

Sue said the FAA policy for ADS-B will be similar to the policy for transponders. The transponder rule has no waiver under Title 14 of the Code of Federal Regulations section 91.205. With few exceptions, pilots are required to turn on the transponder.



More than 400 air shows and aerobatic contests are conducted in the United States each year, and aerobatic pilots use upwards of 170 long-term practice areas. Aerobatic pilots and aerobatic competency evaluators can establish a temporary aerobatic practice area (short-term APA) or an aerobatic competency evaluation/practice (ACE/P) area for 1-30 days. ACE/P is a new program that provides the aerobatic pilot community with a means for access to protected airspace so routines can be practiced and pilots can be evaluated for aerobatic competence. Pilots can also fly aerobatic maneuvers above 1,500 feet as long as their aircraft are not within 4 miles of an airway or over any congested area or open-air assembly of people.

Steve notes that some aerobatic competitions occur in or near airspace where ADS-B “out” is required, such as in Class D airspace or under Class B airspace.

“There is less and less uncongested airspace,” Sue said. “This is especially true on the east and west coasts. Having ADS-B installed on an aerobatic aircraft is an important safety tool for pilots flying in [those] regions. It can also help pilots avoid danger in uncongested airspace that can be found outside of major metropolitan locations.” **IAC**

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DAN RIHN'S  
**ONEDesign**

**ORIGINS OF A LEGACY**

▶ BY LORRIE PENNER, IAC 431036,  
WITH DAN RIHN, IAC 3836





Left: First solo at age 14 in a SGS 2-33A.



Left: Dan Rihn – a great birthday in May 2017 flying his Schweizer 1-26E No. 695. It was 49 years ago that he soloed in a 1-26.

Below: Dan with the Collier Trophy-winning X-47B.



**D**an Rihn began flying gliders at an early age and soloed on his 14th birthday. He flew a J-3 Cub on his 16th birthday and went on to earn his private pilot certificate and commercial rating on his 17th and 18th birthdays, respectively.

Years of competition and seeing the sport of aerobatics become increasingly dominated by expensive and high-powered monoplanes, and what he believed to be an element of judging bias since pilots were not anonymous, began to weigh on Dan. He had seen successful “one-design” special aerobatic contests using stock Pitts S-1T or S-2B aircraft for all pilots, and the concept had been used with great success in the three Hilton Masters of Aerobatics competitions that were held in the 1980s at various U.S. locations.

He perceived that the key to maintaining grassroots aerobatic activity might be a one-design concept for the sport, much like the Schweizer 1-26 single-seat glider. The idea was to level the playing field and bring in an affordable, compact, fun, and easy-to-build airplane for the average homebuilder.

The 1-26, designed by Paul Schweizer in 1954, introduced thousands of pilots to the sport of soaring. The glider offered performance and safe handling for low-time pilots and was truly fun to fly. The design spawned the birth of the 1-26 Association and annual championships. It also inspired Dan’s DR-107 One Design.

Leading up to the One Design concept, Dan had plenty of experience to draw from as an engineer with Northrop Corporation. He earned a Bachelor of Science degree in aerospace engineering and an A&P mechanic rating at Northrup University and finished his 40-year career at Northrup as the chief engineer of advanced projects. During this time, Dan worked on the following projects: F/A-18, F-20, Tacit Blue, B-2, YF-23, X-47A, and X-47B. The highlight of Dan’s career was being a member of the team that won the 2013 Collier Trophy for the X-47B for which he is a patent holder and was a chief engineer.

In early 1978, Dan and Jim Young decided to design their own new aerobatic airplane. At the time, Kermit Weeks was making some waves with his own design based on the Pitts: the Weeks Special (S-1W). The S-1W with its 200-hp Lycoming driving a two-bladed Hoffman propeller was flying circles around any stock Pitts. Dan and Jim wanted to do Kermit one better by using a 260-hp, six-cylinder Lycoming engine. Thus, the S-1X Sunbird was born.

The Sunbird was a work of collaboration, with Dan doing all of the engineering and drawings, Dave and Larry Massey did all the major welding, and Jim purchased stock S-1S wings from the Pitts factory. A stock Lycoming O-540 with a PS-5C pressure carburetor driving a two-blade, 80-inch Hartzell prop was used. The collaborators made their own mold for the canopy using foam and fiberglass, and a local windshield/canopy maker used the mold to pull a single-piece canopy for them.

Jim made his competition debut in the Sunbird while flying in the Advanced category at the Delano aerobatic contest in September of 1979. In October, the Sunbird was a hit at the U.S. National Aerobatic Championships in Denison, Texas.

Other biplane projects followed, including the DR-102 Sunbird, the last two of which were the Goshawk and the Phoenix before Dan turned his hand to a monoplane.



## THE PHOENIX

At the 1983 U.S. National Aerobatic Championships in Mesa, Arizona, Dan's good friend Mike Anderson talked him into designing a new airplane for him. Here again, Kermit's influence got the wheels rolling. Kermit was now flying the Weeks Solution, which was another new biplane with 300 hp. He was the hit of the contest and won the National Champion title. Mike wanted something that could match or top Kermit's design. He had something along the lines of the Sunbird in mind but with even more power.

Mike originally wanted to build four or five airplanes but soon decided that he should build *one* first and see how it flew. The project progressed slowly in the early stages in part due to Mike modifying his flat-wing Pitts by building a set of symmetrical wings for it. When Mike saw how quickly Rich Bastian had built the Goshawk and how beautiful it turned out, he decided to hire Rich to finish the Phoenix.

The Phoenix is somewhat smaller than the Goshawk and bears resemblance to the Sunbird. The wingspan is 17.33 feet, the wing area is 102 square feet (including the fuselage area), and the length is 16.5 feet. The empty weight turned out to be 1,023 pounds and the competition weight is 1,280 pounds. Powered by a pumped-up Lycoming IO-540 capable of putting out 350 hp and driving a three-blade MT propeller, the Phoenix has a power-to-weight ratio of 3.7 pounds per horsepower.

**Above:** The DR-105 Goshawk (left) and DR-104 Phoenix.

**Right:** Mike Anderson and his DR-104 Phoenix at the 1989 U.S. Nationals, placing second in Unlimited.



The first flight was in May 1988. Mike spent about 150 hours in flight testing and learning how to get the most performance out of the Phoenix. The top speed in level flight is 205 mph, and the stall speed is 80 mph; it has an unbelievable acceleration rate and can climb at 4,000 feet per minute.

Mike could easily perform six linked vertical rolls and did as many as 15 total rolls in a torque roll. From level flight at 100 mph Mike could pull to vertical, do a full roll, and then fly away upright (cap off). However, snap rolls, performed at about 140 mph, are the Phoenix's forte. During Mike's 4-Minute Free sequence he does three linked vertical inside snaps.

During the 1989 contest season Mike won every regional contest he entered, including Fond du Lac. Later, at the U.S. Nationals, only 25.034 points, out of more than 13,503 points possible, separated Mike from winning, which placed him second to reigning national champion Clint McHenry.

## THE GOSHAWK

Around the time that Mike was working on the Phoenix, Dan met Rory Moore, an Unlimited competition pilot flying a stock Pitts S-1T. Rory was based in Phoenix, practicing in 100-plus degree temperatures, and the stock S-1T was really struggling. At the 1985 Nationals, Rory talked Dan into designing a new biplane with performance and looks comparable to the Weeks Solution.

Dan started designing what became known as the Goshawk, named after a type of hawk native to western Canada and the western United States. Rory had been involved in the sport of falconry, in which he trained several hawks to hunt. The Goshawk is one of the most highly prized hunting hawks because it's the largest short-wing hawk and can rapidly accelerate from a standing start.

Due to the excellent working relationship Dan had developed with Rich, he convinced Rory to hire Rich to build and coordinate the construction





**Above:** Rory Moore (standing) and Dan Rihn in the cockpit of Rory's DR-105 Goshawk.

of the Goshawk. He also hired Dick DeMars to build the engine and Dan Beckman to build the wings. Construction went very quickly, and on January 25, 1987, the Goshawk took to the air, only 13 months after the project began. Rich had truly built a masterpiece this time, and the joke was that if Rory couldn't win at aerobatic contests he could easily win a trophy for workmanship at a fly-in.

The Goshawk weighs in at just under 1,100 pounds and is powered with a pumped-up Lycoming IO-540, which has a dry weight of 410 pounds. With a compression ratio of 10-to-1, it is capable of producing about 345-350 hp, a tribute to Dick's expertise.

The Goshawk is capable of performing five vertical rolls with relative ease. In his 4-Minute Free routine, Rory has done torque rolls with a total roll count as high as 13. Some of the other maneuvers Rory developed in his 4-Minute Free routine are vertical lomcevak that transition into a torque roll, knife-edge spins, and a maneuver known as the cartwheel (or pinwheel), which is a total of 540 degrees of yaw rotation at the top of a vertical line.

### ON TO A MONOPLANE – THE SABRE

Dan moved from designing biplanes to monoplanes in 1992, though he had done previous work on redesigning Laser fuselage trusses, wings, and control surface geometry. The Sabre was to be a mid-wing, Laser-type monoplane based on Henry Haigh's Superstar, but with a larger engine. Dan used his previous Pitts experience in the design and ultimately redesigned the fuselage truss to accommodate a larger, higher horsepower Lycoming engine, and the Sabre was born. Rory had started the project in 1988 and ultimately hired Alan Geringer and Rick Kunkle to build and coordinate the overall construction, and Wayne Barton was brought in to build the wing. The wing was a fairly standard Laser wing of the period but with modified ailerons to improve roll rate. The design was nearly complete when Rory sold it to aerobatic pilot Cecilia Aragon. Alan and Rick continued and finished the project. Cecilia later changed the wing to a Zivko Laser Z wing.

Flying the Sabre at the 1991 Nationals, Cecilia won a spot on the U.S. Aerobatic Team and the opportunity to fly in the 1992 World Aerobatic Championships held in Le Havre, France. A team member from 1991 to 1994, she was a bronze medalist at the 1993 U.S. National Aerobatic Championships and the 1994 World Aerobatic Championships. Dan was happy to say that one of his designs made it to the world championships.

### THE DR-107 COMES TO LIFE

In the early 1990s, Dan focused his attention on the concept of the One Design, which would provide an economical airframe capable of unlimited performance, and would create a new IAC category dedicated to this new type of aircraft. In addition to the Schweizer 1-26 glider, there were other types of "one-design" competitions and championships that inspired him at the time; such as those in sailing, windsurfing and the IROC Z Car Races.



**Left:** Cecilia Aragon with the DR-106 Sabre.

**Below:** The DR-107 prototype at EAA AirVenture 1993.





# The Legacy Continues

Dan Rihn didn't stop at the One Design. The kitbuilt DR-109 (front) looks like a two-place version of the plansbuilt DR-107 (back), but is really a clean-sheet design.







**Above:** At EAA AirVenture 1994 – left to right Ben Morphew, Dan Rihn, and Doug Dodge.



**Left:** Richard (Dick) Rihn in the DR-107 One Design he built from his son's drawings.

After drawing up the plans for the DR-107 in 1992, Dan worked with Doug Dodge, of Acro Specialties. Jon Staudacher built the wing, and Chris Gardner was chief mechanic on the project and built up an O-320 Lycoming engine that had been lifted right out of a C-172. Chris got a 160-hp performance out of the engine by adding an Airflow Performance injection system and slightly higher compression pistons. Doug built the rest of the prototype, which was sponsored by unsung hero Lew Shaw. Dan gives Lew a great deal of credit for the ultimate success of the project because without him the DR-107 may never have come to fruition.

Doug produced a beautiful prototype in record time, and from its first showing in its assembled form at EAA Oshkosh 1993, it was an immediate success. The aircraft made its first flight soon after, and was quickly sampled by the “who’s who” of the aerobatic world. The prototype had proven the design to be durable, and certainly capable of its proposed goals. There was an immediate demand for plans, and Rick Dean took on the job of producing them.

The prototype was purchased by Ben Morphew who demonstrated the aircraft at both the SUN 'n FUN International Fly-In & Expo and EAA Oshkosh in 1994 through 1996 with the most frequent comment being,

“Who would have believed an aircraft could roll that fast!” Interest in the aircraft grew over the years, with many projects still underway in the United States and countries around the world. DR-107s have been built or flown in 14 countries, including New Zealand, Tahiti, Canada, Argentina, Brazil, France, Spain, Germany, Switzerland, Iceland, and Italy. It has proven the most successful in terms of numbers in the United States, Australia, and Great Britain.

The DR-107 has a maximum speed of 184 mph, stall is 63 mph, and it has a rate of climb of 2,000 fpm. The g-limits are +/-10g. In his February 1994 *EAA Sport Aviation* “The IAC One Design” article, Budd Davisson, commented about the roll rate.

“On the way out to the practice area I had played with the controls and found the airplane to have absolutely no discernable adverse yaw, so rudders were redundant in aileron rolls,” he wrote. “With that in mind, I let the speed build to 160 knots and brought the nose up high intending to do two full-deflection aileron rolls. Stick to the side, I was amazed at how fast it went around. It was significantly faster than even a Pitts snaps. Dan says it has been timed at 420 degrees per second, whereas an S-1S is about 180 degrees. Wow!”

Aircraft Spruce became the plans distributor with a lot of help from Dave Gustafson, Mike Heuer, and Steve Morris, who was IAC president at the time. Dan originally wanted the IAC to sell the plans, but when Jim Irwin, president of Aircraft Spruce, offered to sell them it made more sense. More than 600 sets of drawings have been sold to date.

Unlike one of its inspirations, the Schweizer 1-26 glider, the creation of the One Design did not succeed in its goal of becoming the backbone of a new IAC competition category. It did, however, reach some of its other goals. The One Design flies wonderfully, offers Unlimited category performance, is economical, and is an easy build for the average home-builder. As a great source of delight to



Dan, his father Richard (Dick) Rihn even built his own DR-107. The tail number is N107XR.

Although the concept of the One Design as an IAC category never took off, in the 2017 IAC contest season 13 DR-107s were owned or flown by 18 IAC members. Of those 18 pilots, 12 of them placed in the top three for their category in one or more contests.

Dan flew the Pitts S-1S that he built in 1978 up until 1990. He then went back to his first love — soaring. During his time flying aerobatics, he earned the IAC's top honors with the All Nine Achievements Award (the Primary Stars patch was not included at the time). He is also an award winner in the soaring world, having earned the Soaring Society's Gold Badge with all three Diamonds (aka Diamond Badge).

"The One Design is exciting, if nothing else because it offers serious monoplane performance for sport pilot and akronut alike," Budd wrote in his *Sport Aviation* article. "Also,

**Right:**  
The DR-107 prototype on the cover of *Sport Aviation*, February 1994.



whether the One Design class concept takes off or not, the airplane gives homebuilding a new plansbuilt design that's within the reach of many possible competitors who were previously financially grounded. Now they can get in there and mix it up with the big guys."

"All in all, I think this is one fantastic airplane. Performance is much higher than I thought it would be. I believe this aircraft is capable of holding its own with anything up to and including a S-1! Or souped-up S-1S," Mike Anderson wrote in *Sport Aerobatics* in January 1994. **IAC**



2018 SPORTSMAN  
**Sequence**  
PART 1

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

**A**s I unpack this year's Sportsman Known sequence I do so mostly from the point of view of a fairly new Decathlon or Citabria-type pilot who may have just completed the basic 10-hour aerobatics course. I'm also talking to CFIs who have taught regular barn-stormer-type aerobatics for a while but are new to the competition scene.

I find I am pretty happy with this year's sequence. Except for two instances, this sequence is reasonably friendly to high-drag, low-horsepower airplanes, like the 150-hp Decathlons and the Citabrias, yet it still has some interest for the Pitts Specials out there. It has a nice, high-energy flow. Let's dig into it!

As an instructor in many other areas in addition to aerobatics, I have learned to look for the big picture view, or strategic view, of a thing first, before digging into the details.

The first strategic idea I want to point out is the pilot's mental view of how the flight controls *really* work. Having the correct view of flight control usage makes aerobatics so much easier.

The second strategic idea in aerobatics is "where to look and when," as said by World Champion Charlie Hillard in the EAA video *Getting Started in Aerobatics*. Looking in the right place at the right time during each maneuver makes each one easier to fly.

Aerobatic coach John Morrissey also talks about *how* to look, with what he calls "deep focus." As we will see later, ideas one and two go together in aerobatics, especially in the aileron roll (meaning the slow roll — more on this later).

The third strategic idea is that, mathematically, the roll is the thing. As John pointed out in his excellent February 2012 *Sport Aerobatics* article, "The Roll," aileron roll (slow roll) quality directly affects 25-30 percent of the K-factors, and indirectly affects 50-80 percent of the K-factors. A pilot would do well to get on top of this most frustrating of maneuvers.

The fourth strategic idea is for the Sportsman pilot to mentally prepare him or herself to take a break during a sequence. Mathematically, it is better to take a break and take the penalty than it is to fly a truncated maneuver that scores badly. A score of four for a badly flown maneuver, multiplied by the K-factor for that maneuver, hurts much worse than taking the penalty points for an interruption.

That scoring difference was intentionally designed into the program to enhance learning and safety. The flying of a chopped-up maneuver by new (and not so new) pilots, in an attempt to stay in bounds, is what frequently causes unsafe flying. Beware, and be ready to take a break. Your flying will not only be safer, you will also score higher.

#### HOW FLIGHT CONTROLS REALLY WORK

Former flight instructor of the year and master CFI-aerobatic Rich Stowell said it best. He stated that the flight controls work in relation to the pilot not the horizon. Pitch is a head-to-foot motion of the tip of the nose of the airplane, not up and down. Yaw is an ear-to-ear motion of the tip of the nose of the airplane, not left and right. Up and down and left and right, in relation to the horizon, only work in upright flight with less than 40 degrees of bank. Up and down and left and right ideas do not work in knife-edge or inverted flight.

The airplane does not know the horizon exists. It can only "feel" relative wind and gravity, and it can only move around the lateral, longitudinal, and vertical axes in pitch, roll, or yaw. Those three axes move with the airplane; they don't hold position in relation to the horizon. As stated in Wolfgang Langewiesche's landmark book *Stick and Rudder*, the airplane is the horse, and you must think like the horse. The horse is quite uninterested in thinking like you do, or in seeing the world as you do.

Understanding the concept that pitch is head-to-foot and yaw is ear-to-ear is also the key to making the aileron rolls (slow rolls) work out.

#### WHERE TO LOOK AND WHEN

As an instructor, I have seen that pilots' flying gets better the further away they focus from the airplane. It is not natural for them, however, and they must be taught to do it.

The eyes at rest will go to what is called infinity focus. They focus on a spot about 30-60 feet in front of them, which brings peripheral vision detection to a higher level, unconsciously looking for predators. Peripheral vision is probably good in *that* situation, but it pulls us away from John's deep focus concept.

John maintains that a "clear and distinct focus to the furthest point ahead of the aircraft's flight path must be maintained." In level flight he wants pilots to be focused on a spot 20 miles away. "When vertical down I want them to pick out blades of grass. This is the beginning of situational awareness in all axes of flight."

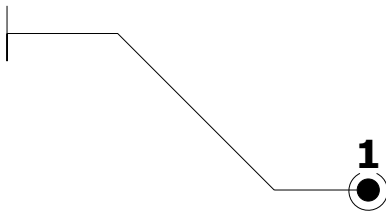
If they are not consciously looking to a spot on the horizon they cannot make the tip of the nose draw British National Aerobatic Champion Alan Cassidy's "sacred circle" when doing a slow roll.



**BOX ENTRY**

Yes, Dorothy, the box entry and the wing-wags *are* a maneuver. New people tend to come into the box in a low-energy manner with half-hearted wing-wags. No, no, no. Come in fast, loud, strong, and snappy! Make a good first impression. As competitor Larry Connor said, “Fly it like you stole it!”

Treat the box entry like maneuver 1A. When you practice the whole sequence, include the box entry as well. Also, set up your box entry so that your aircraft is exactly at the speed and altitude desired for the pull-up into the first printed maneuver (1B). That takes some practice.



Maneuver No. 1, the 45-degree upline.

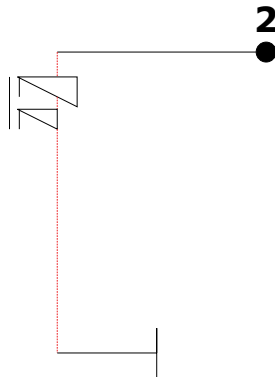
**THE 45-DEGREE UPLINE**

The 45-degree lines are not only in this maneuver, they are also part of maneuver Nos. 5, 9, and 10. Forty-five-degree up- and downlines require ground coaching. Remember, you fly for the judges not yourself. Flying the lines well depends on the pilot’s eye position.

Whatever sighting system is used, it is very important that the pilot be absolutely anal about seating position. Always sit so that the eye position in relation to the sighting system or airplane structure is the same on every flight.

When flying the 45-degree upline, leave some energy for the top. The judges must see that the 45 upline ended and that the aircraft began a segment of level flight.

Also, when it comes to 45-degree lines, most new people are shallow. Getting ground coaching would be best, but if you can’t get it, being a little steep is better than being a little shallow. As judge Randy Reinhart said, if half of the score sheets say “shallow” and half say “steep,” steepen up your 45 lines. That will get rid of half of the demerits.



Maneuver No. 2, the 1-1/2 spin.

**ONE AND ONE-HALF TURN SPIN**

Four things must be kept in mind for spins. First, don’t settle or climb on the entry line. I watch my altimeter as I am slowing down toward the beginning of the spin departure. Settling is most common.

The second thing is the entry criteria. Here is what the judges must see.

To quote the rulebook, “When the aircraft stalls, the aircraft must simultaneously move around all three flight axes: (1) the nose will pitch toward the ground; (2) the nose will yaw in the direction of spin; (3) the wingtip will drop in the direction of the spin. Failure to achieve simultaneous motion about all three axes will be downgraded one point per five degrees of deviation on *each* axis.”

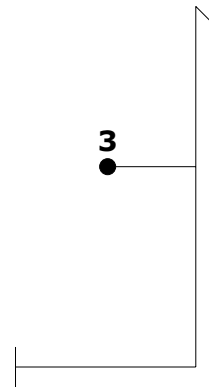
Third, the spin exit must be practiced enough so that a finish on heading is reliable and the pilot must maintain orientation throughout. This is critical. Please don’t charge off, unknowingly, in a “zero-inducing” direction. Keep your situational (directional) awareness in relation to the X and Y axes.

Fourth, get reliable ground coaching to make sure your downlines are *straight* down. Setting the trim before the sequence begins (and leaving it there throughout) at something slightly *above looping speed* will help in this area. If the trim is set to a slower speed, the airplane will want to pitch “up” when it gets to that speed. This will require the pilot to push to maintain the downline.

Holding a good downline relies upon the judge’s perception, which is why you need ground coaching and practice. If the trim is set right, the airplane will seek the center of the Earth, requiring little stick pressure. A lot of new competitors tend to push too much going downhill, getting “negative,” or over on their backs. When your headset is flying “up” off your head you *may* be pushing too much!

Also, as the downline is being established, the rudders must be used to make sure neither wing is low.

Lastly, the second you finish the spin and begin the downline, hammer the power! You need to feed a lot of energy into the next maneuver. If you have full power, you will gain speed quicker while losing less altitude (believe it or not) and your elevator will work better for the pullout.



Maneuver No. 3, the hammerhead.

**THE HAMMERHEAD**

The hammerhead is fun to do. It is also a maneuver that can induce an inverted spin if mishandled. It is the upline and the rotation we must discuss.

In this discussion we’re in a left hammerhead with a clockwise (from the pilot’s perspective) turning engine.

First, the more vertical the upline, the better the rotation. I have found that once the vertical line has been set, the stick cannot be frozen in position. The Decathlon, for instance, will slowly creep on its back (negative) as it goes uphill and slows down. Don’t let it.

The engine at full power will “torque” the aircraft as it slows. This will cause the aircraft to roll left, which is a downgrade. Put in right aileron as necessary to prevent any rolling on the upline.

The “kick,” or pivot, is really a rapid and smooth push of the rudder to the stop, followed a split-second later by opposite aileron and then forward stick. These movements are not to be done simultaneously, but sequentially. The aircraft type will determine the timing. The rudder and elevator are effective immediately because they are in the prop slipstream. The aileron only becomes effective once the wingtip is moving in yaw and it has some relative wind over it.

The rudder begins the left yaw motion, giving the right wingtip more relative wind. This pulls the right wingtip into a left roll. The opposite aileron input, in this case right aileron, is added to prevent this roll. Enough aileron must be added so that the aircraft yaws “in plane” with no rolling motion present. Any roll is a downgrade.

Here is where we enter the possible inverted spin zone. The left yaw motion causes gyroscopic forces in the propeller to pitch the airplane on its back. Pushing the stick forward cancels out this pitching to keep the aircraft yawing “in plane.”

Preventing the inverted spin entry is all about not overdoing the forward stick input.

Rich Stowell taught me a neat trick that helps the pilot use the correct amount of forward stick.

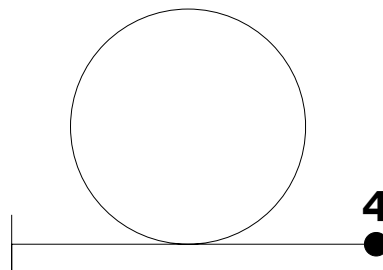
At the end of the vertical line the pilot is usually looking at the sight gauge or part of the aircraft structure in relation to a spot on the left horizon, in the case of a left hammerhead. It is natural for the eye to want to follow the wingtip down across the ground as the rotation begins, but you must resist it.

Instead, keep the eyes on that spot on the horizon and let the wingtip(s) drop away out of sight. Then, apply just enough forward stick to put the tip of the nose through the same spot on the horizon the wingtip or sight gauge just vacated.

It is very hard to keep the Pitts Specials from torqueing around during the rotation. I was taught to pull power a little bit just before the rotation begins, which really helps. Don’t pull power too much, though, or the second half of the rotation will stop working. It takes a lot more forward stick to counteract the gyroscopic pitching in the Pitts than it did in the Decathlon.

When the nose reaches straight down, just neutralizing the rudder pedals will bring about a “pendulum” effect, which is a downgrade. To avoid this, put in full opposite (right) rudder when you’re about 30-ish degrees away from straight down, then quickly go to neutral. That will stop the nose quite smartly with it pointing straight down. Once the pivot stops you don’t need as much forward stick, so ease off. Avoid pushing negative on the downline.

Hold the downline long enough to have energy for maneuvers 4 and 5 — especially No. 5.

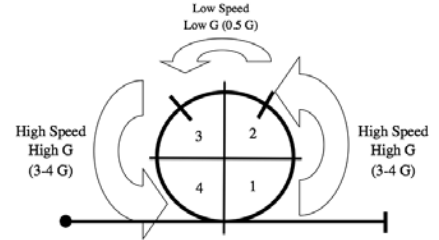


Maneuver No. 4, the loop.

### THE LOOP

The loop is maneuver No. 4, but this discussion also applies to the partial loops in maneuvers 6, 9, and 10.

We fly the loop in thirds, but we must analyze it and judge it in quarters. Quarter No. 1 is free to the pilot and sets the standard. Whatever radius is drawn in quarter No. 1 must be re-created in quarters No. 2, No. 3, and No. 4. Quarters No. 2 and No. 3 are the hardest to fly over the top as the airplane’s energy state is at its lowest, with No. 3 being “the downgrade zone.”



The loop is broken into the four segments.

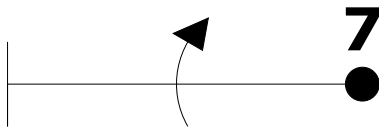
The first key, especially in a low-performance airplane, is to make quarter No. 1 small. Keep quarter No. 1 small enough that you can duplicate it three more times. It is very important to pull enough g in the first quarter, at least 3.5g, or you won’t have enough horsepower to make quarters No. 2 and No. 3 look good.

Also, enter the loop fast. Think of book looping speeds as minimums. This is good advice in general, but is even more important in this sequence. Come out of the hammerhead with enough energy to not only get through the loop but to do a decent upline for the beginning of maneuver No. 5.

As you finish the loop pull just a little less g at end of the fourth quarter. The aircraft is going a little slower in the fourth quarter than it was in the first, and most people tend to finish the loop “high.” This means the exit altitude was higher than the entry altitude, which is a downgrade.

Loops, and the parts of loops, must also be wind corrected. When presented with a strong headwind or tailwind you can make an adjustment, widening out into the wind and tightening up with the tailwind. Just don’t overdo it. A 5-10 percent adjustment should do it.

Loops are hard to do well and usually suffer under the judges’ pens. I highly recommend that every Sportsman pilot get a freestyle, even if it’s borrowed from someone else. And the first thing I do on my freestyles is get rid of the loop! If you look in the rulebook, the loop is not required on the freestyle. Most airplanes like angles better. Why do the loop three times?



Maneuver No. 7, the aileron roll.

**THE AILERON ROLL**

I am doing the aileron roll, maneuver No. 7, out of order because its elements and techniques apply to the partial rolls in the half-Cuban (No. 10), the goldfish (No. 9), and the wedge (No. 5).

Competition aileron rolls, which are really slow rolls in technique, are one of the harder things to teach in the basic aerobatic course. You must not pitch first before initiating the roll as you would in a pure, 1g, Bob Hoover-smooth, *coordinated* aileron roll. A slow roll is definitely *not* coordinated as top rudder, or sky rudder, is applied in each knife-edge portion of the roll.

Unfortunately, for maneuver No. 7 the airplane will be coming into the roll with low speed due to the exit from the Immelmann, which makes it harder to fly. Maneuvers 5, 9, and 10 have rolls on the 45 downline, which will give them good energy. Enter maneuver No. 6 *as fast as you can* to have energy for maneuver No. 7.

The main problem in this maneuver is that people do not maintain the straight and level path before, during, and after the roll. Sinking during the

roll is quite common, especially in the inverted and second knife-edge portions of the roll. Another problem is not maintaining a constant roll rate. Most pilots allow the roll rate to speed up in the second half of the roll.

People also end up off heading, usually to the right in a left roll.

The key to a good competition aileron (slow) roll is picking a spot on the horizon, and then drawing the sacred circle with the tip of the nose around that spot. Deep focus must be maintained throughout the roll, which will be a challenge in and of itself as the controls are manipulated.

**THIS SEQUENCE IS REASONABLY FRIENDLY TO HIGH-DRAG, LOW-HORSEPOWER AIRPLANES.**

If we consider a left roll, the tip of the nose starts at 6 o'clock on the sacred circle, rotates counter-clockwise up to 3 o'clock for the first knife-edge, continues up to 12 o'clock when inverted, down to 9 o'clock for the second knife-edge, then back to 6 o'clock. The controls must be manipulated in such a way to "draw" that sacred circle with the tip of the nose around that point on the horizon.

Remember our earlier conversation about pitch being a head-to-foot motion and yaw being ear-to-ear motion of the nose of the aircraft, and that these motions are in relation to the pilot. That will apply here.

Some airplanes need a higher nose attitude when inverted at the 12 o'clock position on the sacred circle. That makes the sacred circle tall at the 12 o'clock point, which is why I sometimes call the sacred circle the "sacred egg." To find this 12 o'clock attitude, the pilot must first fly inverted at different speeds to see how high the nose has to be above the horizon *while holding an altitude*.

When rolling past 3 o'clock on the sacred circle, on the way to 12 o'clock, there must be enough push added to get the nose up to the correct inverted attitude. Blend this push in between 3 o'clock and 12 o'clock.

Enough knife-edge practice must be flown to determine how much top rudder must be held to maintain altitude at the selected speeds. Since an aircraft in a slow roll is basically in a slip from before the first knife-edge until past inverted (left aileron for the roll and right rudder for "top" rudder), it is losing energy throughout.

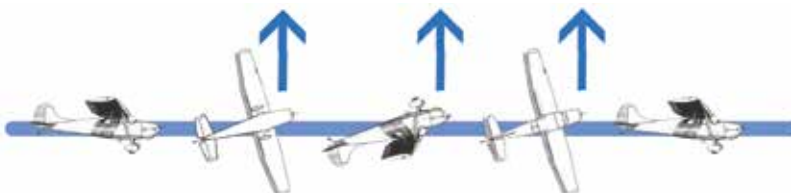
A good trick taught to me by Emerson Stewart here in Ohio was to not switch the rudders (when switching to the other top rudder) when passing through 12 o'clock, but to wait until about the 10:30 position.

Additionally, as it says in Alan's book, *Better Aerobatics*, a little push with the elevator at about the same time as the feet are switched (10:30) will also keep the nose pointed in the right direction as the rolling motion continues, rounding out the second half of the sacred circle. This push will fix the problem of ending off heading to the right all the time.

Once the rudder pedals are switched the roll rate will increase, which is a downgrade. This happens because once the pilot shifts to the left rudder for "top" rudder the aircraft is no longer slipping. Ease off the aileron deflection a bit when the rudder pedals are switched so the roll rate stays the same.

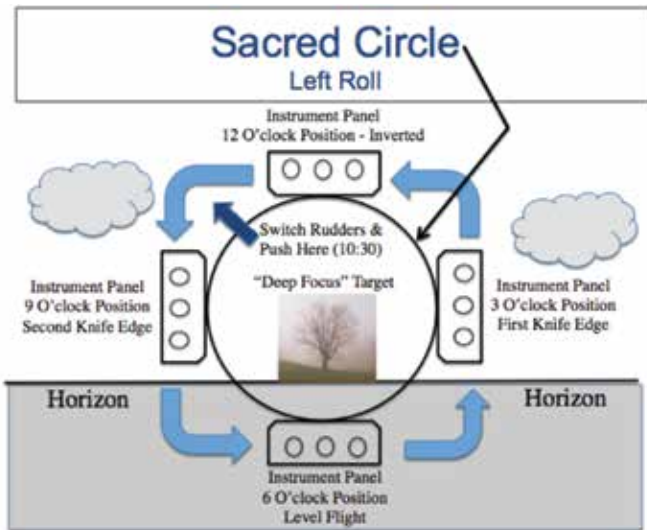


1g or og "Bob Hoover" aileron roll.

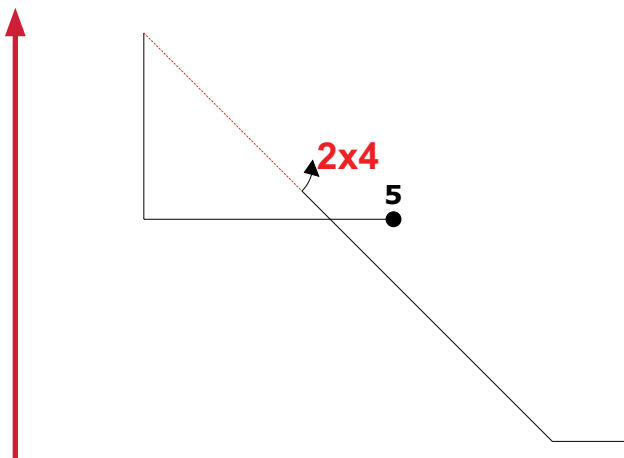


Competition aileron (slow) roll.





Alan Cassidy's sacred circle.



Maneuver No. 5, the wedge/sawtooth.

**THE WEDGE OR THE SAWTOOTH**

The wedge is a family one figure, which means that the three radii do not have to be the same size. With that being said you must still have enough energy to draw a constant radius across the top, not flop, even though that radius can be a lot smaller than the other two.

Second, the lines within the figure do not have to be the same length. In Figure 5 it will be very hard for low-horsepower, high-drag aircraft to have enough energy to show the vertical line and to also draw a radius across the top. Start this maneuver fast — as fast as you can. The vertical line does not have to be any minimum length, but the judges have to see it. Coaching will help you with this.

As for centering the roll, until ground coaching helps you make an adjustment, make the line before and the line after the roll equal in *time*. Judge perception will usually see equal time as equal distance flown. It is not perfect but it is a place to start. Later, with coaching, you will find that you'll need to spend a slightly longer time on the slower line than on the faster line to make them equal in *distance*. The timing difference is small, however, and is not as great as a 2-to-1 ratio.

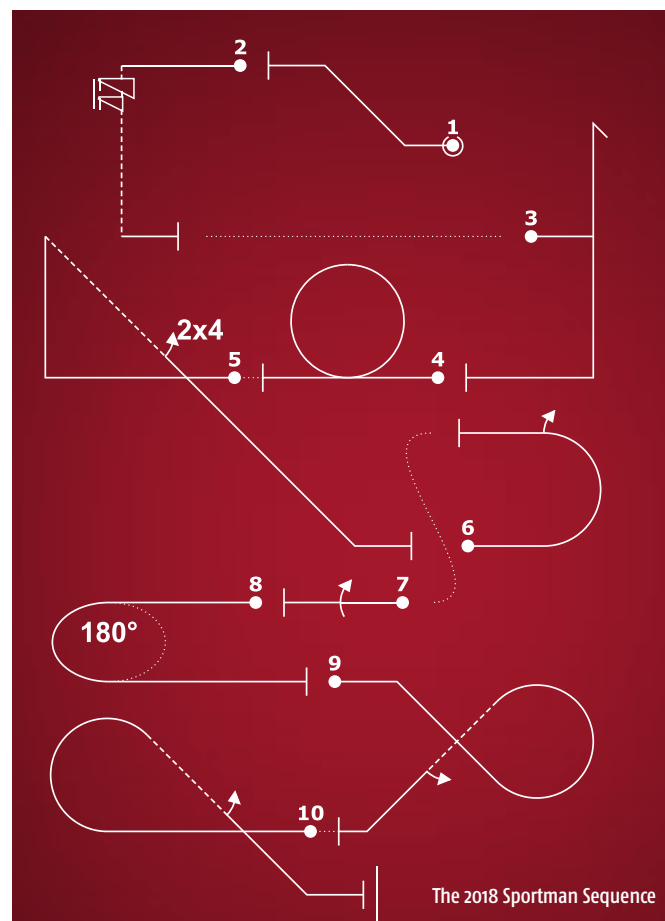
As for the 45-degree lines, just like the level rolls the aircraft center of gravity "dot" must track the same line throughout the roll. Again, the greatest problems maintaining a straight line through the roll are in the inverted and knife-edge portions of the roll. See the aileron roll about this.

The pause needed to show the first point in the 2x4 roll must be long enough for the judges to see it. One recommendation is to pause as long as it took to roll to that point. The slower rolling aircraft will have to pause longer, or the judges may not see it.

On the 45-degree downlines pick that spot on the ground for your deep focus and do your sacred circle around that point.

Now you see why I talked about the 45 lines and the full roll first.

Practice, practice, practice. Stay hydrated. Take your parachute. See you later for Part 2. Fly safe! **IACF**



The 2018 Sportman Sequence



## Snowbird Classic 2018

BY HECTOR RAMIREZ, IAC 18975, CONTEST DIRECTOR

▼  
**THE EAA CHAPTER** trailer has been loaded with the banquet tables and chairs. Sighting devices have been taken down and stored for next year's contest. Now it's time to sit down, take a little breather, and tell you how it went.

Central Florida has probably the country's best year-round weather, providing favorable flying conditions even during winter and spring. This has enabled Chapter 89, based at Leeward Air Ranch in Ocala, Florida, to organize the first IAC contest of the season: the Snowbird Classic.

This year, the chapter has been honored to serve as hosts and provide the training grounds for the U.S. Advanced Aerobatic Team. The pilots spent the week before the contest practicing and improving their aerobatic skills in our aerobatic box under the skillful guidance of team coach Nikolay Timofeev. With financial support from Chapter 89, all team members were able to compete without expense. Additional monetary incentive was also provided by the chapter to aid the team pilots and coach with the high cost of international competition preparation. Chapter 89 is more than honored to make this contribution to the team. We are convinced that it takes this type of support to facilitate the daunting task of intense preparation for world competition. May this serve as a springboard to a successful World Advanced Aerobatic Championship in Romania. Go, team USA!

Following several days of box practice, the contest commenced on Thursday, April 5. Only the Advanced Known was flown in the afternoon. Team manager Mark Fullerton felt especially inspired and "in the flow" as he took top honors for the flight. That definitely put pressure on the rest of the team members to ramp up their game!



Attending U.S. Aerobatic team members. Left to right: Back row: Stan Moye, Matt Dunfee, Coach Nik Timofeev, Marty Flournoy, Johnny Wacker. Front row: A.J. Wilder, Mark Fullerton, Angelo Gillaroto.



Doug Vayda serves Monique Hartmann, Evgeny Komarov, and Bill McLean.



Laurie Ramirez awards the "Big Britches" to Marty Flournoy. It takes a big man to fill those aerobatic underwear, and Marty is just the pilot to do it!



2018 Snowbird Classic competitors and volunteers at Florida's Marion County Airport.



On Friday the remaining categories flew their Known and Free sequences. It was a busy, productive day with more than 35 pilots flying multiple times. Pilots throughout the southeast participated, with some from as far away as Colorado and even Germany.

Contest day on Saturday proved to be a challenge. Blustery winds at or near maximum allowable speed and low ceilings preceded an approaching front. It was high anxiety for the pilots who had to deal with an Unknown sequence, figure out how to manage winds, and decide where to place the optional weather break. Unfortunately, because of weather and time limitations, only the Advanced category flew under these adverse conditions.

It was impressive to see the command, control, and precision displayed by team members — it was obvious the intense training is paying off in improved performance!

Howling winds, lightning, and torrential rains preceded the banquet, but inside the National Parachute Test Center hangar, the mood was light and festive as Southeast Aero's Doug Vayda prepared his "low-country boil" for the evening meal.

Kevin Campbell, contest chief judge, emceed the event, providing entertainment, distributing awards, and auctioning prizes to help cover contest costs. A 5-by-8-foot American flag signed by competitors, volunteers, and staff was presented to the U.S. Advanced Aerobatic Team to fly proudly in Romania.

Kevin, along with Laurie Ramirez, volunteer coordinator; Liza Weaver, registrar; and Mark Stewart provided the heavy lifting to ensure a successful contest. Other key personnel included Pete Eslick, assistant contest director; Ralph Sebexen, starter; Chris Magon, technical committee; Marty Flournoy, safety director; Danny Adams, technical committee; Tangie Campbell, scorer; and many other important volunteers. Even Gary DeBaun, last year's U.S. Nationals contest director,



Primary competitors Vibeke Gaard and Natalya Shemigon.

Sportsman competitors Warren Gilliers, Jeff Schneider, and Jerry Esquenazi.



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Intermediate competitors Kevin Campbell, Mark Budd Jr., Shaun Brautigian, and Wayne Asplundh.

Advanced competitors A.J. Wilder, Johnny Wacker, and Mark Fullerton.



came in to help with the contest. Contest support was great, with several volunteers traveling long distances and across several states just to provide needed help!

Although contest results will be posted on the IAC website, the top pilots in each category deserve special mention. These include the overall winners in Primary: Bo Gwinner, first place; Vibeke Gaard, second place; and Natalya Shemigon, third place. Vibeke and Natalya flew in from Denver, Colorado, to compete in the contest.

In Sportsman the first three category winners, in order, were Warren Cilliers, Jeff Schneider, and Jerry Esquenazi. Jerry flew his beautiful RV-8, and Jeff took second place in his Decathlon!

Intermediate winners were Shaun Brautigian, Mark Budd Jr., and Kevin Campbell in first, second, and third, respectively. Nice job, fellas.

In Advanced, first place went to Mark Fullerton. Not too shabby for the team manager! A.J. Wilder and Johnny Wacker rounded out the top spots for a U.S. Aerobatic Team sweep!

On a historical note, the first Snowbird Classic was co-founded by Mark Stewart and fellow Chapter 89 member Chuck Cohen in 2015. Unfortunately, we lost Chuck last year to a chronic illness and miss his wit, intellect, and passion for aerobatics. Mark continues to provide tremendous support in obtaining the FAA aerobatic waivers, interfacing with the local community and FBO, as well as providing the muscle for box marker and sighting device duty. Mark does all of this despite having moved to the Atlanta area last year! We have a strong cast of volunteers and pilots, which should continue to make the Snowbird Classic the opening salvo of each new aerobatic season!

For contest information, including scores, check out IAC89CD on Twitter, and for general information on the chapter find IAC Chapter 89 on Facebook. **IAC**

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# Don Hartmann

BY GARY DEBAUN, IAC 4145

IAC 20476  
Nickname: Oilcan  
Occupation: Roofing contractor  
Chapter affiliation: IAC Chapter 23  
Age: 52

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## **GD: HOW DID YOU GET STARTED IN AEROBATICS?**

DH: I got started in aerobatic flying after my father and I bored of flying straight and level. I did the typical and bought a Citabria and the *Basic Aerobatics* book. I quickly realized that I really needed professional training. I went on to fly my first contest that year; it was so much fun that I haven't stopped competing for going on 26 years.

## **GD: YOU HAVE AN INTERESTING NICKNAME: "OILCAN." HOW DID THAT COME ABOUT?**

DH: I was given my nickname at my first Sebring contest. I was flying my Citabria 7ECAA in the Sportsman category. In Sebring, we arrive five days before the contest starts, and we practice every day. My Citabria did not have an inverted oil system so in a week of flying my plane used up all the oil the FBO had in stock — around five cases. Everyone saw me putting oil in my plane after every flight instead of fuel and immediately started calling me Oilcan. The next contest I brought five cases of my own oil.

## **GD: WHEN AND WHERE WAS YOUR FIRST CONTEST? HOW DID IT GO?**

DH: My first contest was Sebring, of course. The year was 1992. I placed overall around seventh with about 25-30 pilots in the Sportsman category. That week in Sebring was the best time I had ever had to date so I was hooked.

## **GD: YOU'VE BEEN AROUND A LONG TIME. GIVE US A LIST OF YOUR AEROBATIC RIDES AND TELL US WHICH ONE WAS YOUR FAVORITE.**

DH: My first airplane was a 1949 Navion. After that, a Citabria, then a Pitts S-2B, and finally my current airplane is the Extra 300S. The Extra has really been an amazing airplane for me and has allowed me to move to the Advanced category safely. So, I guess you would say the Extra is my favorite, although I loved every year (15) I had in the Pitts. The Pitts and Citabria really developed my pilot skills.

## **GD: IF YOU COULD HAVE ANY AEROBATIC AIRCRAFT (MONEY NOTWITHSTANDING), WHAT WOULD IT BE AND WHY?**

DH: An Extra 330 SC. This is an amazing machine — the power, maneuverability, and its proven capability at the world level. My motto is, "If it ain't an Extra, it ain't enough!"

## **GD: HOW DID YOU MEET YOUR WIFE, MONIQUE? AND HOW DID SHE BECOME SO INVOLVED IN AEROBATICS?**

DH: We met through a friend in 1999. She went with me to Sebring for the first time in 2004 and fell in love with the sport and the aerobatic gang. She started helping at contests and loved the work. She loves this sport as much as I do and is my biggest supporter.

## **GD: I LOVE YOUR HOUSE AND HANGAR. A LOT OF AEROBATIC PILOTS LIVE AND FLY OUT OF YOUR LITTLE AIRPARK — TELL US ABOUT IT.**

DH: Our house is at Willis Gliderport (FA44) in Boynton Beach, Florida. There are and have been many residents here that have deep ties to IAC: Mike Mays, Dean Meredith, John Lillberg, John Moore, Charlie Bedner, Ted Ballou, Mike Knight, Brandon McNeilus, Denny Jones, and Kenny Lillberg.

Almost everyone in aerobatics and IAC has either visited our airport or heard of it. This airport has a very rich history of aerobatics dating back to the 1980s. There has always been a waived box next to us where critiquing is possible from driveways. Practice weekends, many active IAC competitors, and lots of barbecues full of aerobatics people are some of the reasons we love it here.



**GD: DO YOU HAVE ANY PRE-AEROBATICS ROUTINE, LIKE STRETCHING, YOGA, OR LISTENING TO MUSIC?**

DH: Of course I walk the sequence, and preflighting the airplane is important to me also. I do a *very* thorough preflight every time, even if I already flew that day. I am able to really focus while looking the plane over.

**GD: YOU AND MONIQUE HAVE BEEN AROUND THE IAC A LONG TIME. ANYTHING YOU WOULD LIKE TO SEE CHANGED?**

DH: I would like to see the sport promoted more.

**GD: WHO IN THE SPORT HAS BEEN AN INSPIRATION TO YOU?**

DH: I am only in this sport because of Mike Mays. Somehow in a smoky

honky-tonk bar he recognized me and knew I was the “guy doing 15-turn spins in a Citabria” near the Willis box. He told me, “You need to come to Sebring.” Not only did he introduce me to an amazing sport, but I also gained one of my closest friends. Mike and I have been friends for nearly 26 years. He has been my mechanic for nearly that long, my critiquer, my wingman, and now my neighbor. I have a great amount of respect for him as a friend and also his aerobatic knowledge. Plus, he has probably saved my life more times than I can remember.

**GD: DO YOU HAVE ANY INTERESTS OUTSIDE OF FLYING?**

DH: I have outgrown all of my other hobbies. My interests now are flying and work. **IAC+**

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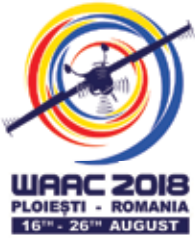
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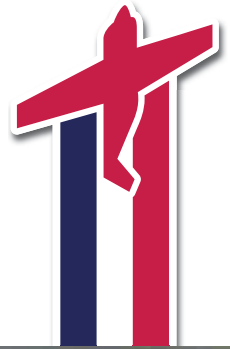
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## EXTRA! Team USA Sweeps the Snowbird Classic!

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Come on out and give us a challenge or just to support us at our next championship practice June 8-9, 2018, at the Bear Creek Bash Contest in Rome, Georgia.

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