SPORT
Aerobatics
May 2014
OFFICIAL MAGAZINE of the INTERNATIONAL AEROBATIC CLUB

19th Annual Safety Issue

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SPORT Aerobatics

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—Spencer Suderman

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THE COVER

Andrew Wright flies his Giles 202 on a beautiful afternoon. Photo by Glenn Watson (*machpointoneaviation.com*)

SPORT Aerobatics
OFFICIAL MAGAZINE of the INTERNATIONAL AEROBATIC CLUB

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REGGIE PAULK
COMMENTARY / **EDITOR'S LOG**

May Is Safety Month

Authors recounting lessons learned

MAY IS TRADITIONALLY referred to as safety month, and we have brought a few good stories for your perusal. One safety problem addressed in this issue is a potential fault in the canopy latch mechanism on the Giles series canopies. A recent canopy departure luckily ended up only damaging the aircraft, but any number of factors could have conspired to turn the incident into a tragedy. I give thanks to the gentlemen who kindly shared their stories and photos of both the problem and recommended fix.

Conditions can sneak up on you rapidly—have an escape plan for those moments when indecision clouds your thinking.

Todd Ashcraft and Andrew Helfer once again share their story of bailing out of their ailing Christen Eagle biplane. The story initially appeared in the 2003 safety issue. If you look closely, you can clearly see the outline of Todd's body in the bean field where he impacted spread-eagled on his back after an ultra-low bailout and canopy deployment. He was hoping we could draw the outline of his body Wile E. Coyote style in the beans for effect—he says we don't have enough humor when talking about the serious business of accidents. He and Andrew's account is certainly not funny—but there are elements of levity to be sure.

Spencer Suderman brings us his account of breaking the record for most number of turns during an inverted flat spin. It would seem that the third time was definitely the charm, as he plummeted from 23,000 feet over the California desert to claim his hard-earned title. You may see a video if you visit *EAA.org/intheloop*, and click on the April issue. For those of you who don't know Spencer, he's got quite a sense of humor. His serious attempt at the world record stands in sharp contrast to his hilarious personality. Congratulations, Spencer!

Steve Johnson brings us an accident summary of the 2013 flying season. Over the years, the numbers and types of accidents have remained relatively constant. Please take a moment to consider that your safety ultimately depends on your decision-making and skill. A recent accident involving a highly skilled airline and air show pilot highlights this point. Although there is no probable cause as of yet, it appears he impacted the side of a mountain while skirting some springtime weather. Conditions can sneak up on you rapidly—have an escape plan for those moments when indecision clouds your thinking. *IAC*

Please submit news, comments, articles, or suggestions to: *reggie.paulk@gmail.com*

DOUG SOWDER
COMMENTARY / **IAC PRESIDENT, IAC 14590**

Please send your comments, questions, or suggestions to: *dsowder@aol.com*

The Simple Propeller

It's not all as simple as it appears

My propeller is at the propeller shop for overhaul, an every 500-hour event for an MT prop used for serious aerobatics. For the safety issue of *Sport Aerobatics*, I think a few thoughts on propellers may be in order. An airplane's drivetrain seems so simple: a two- or three-blade propeller and an engine to rotate it by burning copious quantities of fuel. However, it's not all as simple as it appears.

There are two fundamental classes of propeller used on single-engine piston aircraft—constant speed and fixed pitch. The constant-speed propeller's pitch (the blade angle, measured in degrees, or the theoretical "advance" of the blade per revolution, usually denoted in inches) can be varied in response to operating conditions. For the engines we use, horsepower is a product of torque and rpm, and in the usual rpm ranges of 2300 to 2700, at wide open throttle (WOT), it happens that the engine's torque output is fairly constant. So the path to more power is through more rpm. A constant-speed prop makes this adjustment easy by means of a governor. The governor includes an internal pump that pumps engine oil pressure up to the 300 to 400 psi range, and that pressurized oil flows through a hollow crankshaft to the propeller, driving a piston in the hub that adjusts blade pitch. The governor incorporates rotating "fly weights" that control a valve to set the pressure in the prop hub, thus adjusting the pitch of the blades. The fly weights work against a "speeder spring," controlled by the pilot by means of a linkage to either a push-pull knob or a quadrant lever. The pilot sets the compression of the speeder spring to provide a desired rpm, and if rpm increases due to, say, airspeed, the fly weights "fly out," causing the oil valve to change the pressure in the propeller hub to return the engine to the desired speed by increasing the pitch of the blades.

Most constant-speed propellers on single-engine aircraft use increasing oil pressure to force the blades to coarse pitch, thus tending to decrease rpm. Centrifugal force acting on the blades tends to rotate the blades toward fine pitch; the balance of these forces maintains a constant rpm as set by the pilot. This arrangement is light in weight and allows a small propeller hub and spinner. For us aerobats, there is one disadvantage...our engines run in all attitudes and despite the efforts of the inverted oil systems, sometimes lose oil pressure during maneuvering. The result can be overspeed as the governor does not receive enough oil to hold the blades in, or move them toward, coarse pitch.

Most aerobatic constant-speed propellers use counterweights on the blades, which tend to rotate the blades toward coarse pitch as rpm increases. The governor works opposite that described above, and provides oil pressure to move the blades toward fine pitch. If oil pressure is lost momentarily, the blades will go coarse and overspeed is averted. Disadvantages include the heavy counterweights and the large spinner needed to contain them. It is very important to keep close watch on the behavior of your constant-speed propeller. If it's counterweighted, a drop in rpm at high temperatures or on extended uplines can mean insufficient engine oil is reaching the governor, or it can mean that the engine's forward bearing is worn and governed oil pressure is leaking out through excessive bearing clearances before it gets to the prop hub.

Fixed-pitch propellers seem simpler than the constant-speed variety, and physically, they are. There is no hydraulic mechanism; it's just a slab of wood, metal, or composite formed into a pair of blades with a suitable hub to bolt onto the crankshaft. The downside is that the engine rpm now will be directly related to true (yes, not indicated) airspeed. So, as you push the nose of your Pitts down and accelerate through 180 mph, you could see well more than redline rpm. Conversely, during the takeoff run and climb-out, you may only see, say, 2400 rpm, considerably less than your engine's rated 2700, and you know that you are leaving some power on the table. There is a temptation to use a lower-pitch propeller to get more climb performance, knowing that it will overspeed during many maneuvers. Most production aircraft with fixed-pitch propellers are equipped with a propeller that will provide reasonable climb performance, and most POH's recommend reducing throttle if necessary to limit engine rpm to below redline.

If you are flying a high-performance fixed-pitch aircraft, such as a Pitts,

Laser, etc., take a look at the *Technical Tips Manuals* published on the IAC website. There are four volumes of this excellent reference. The two lead-in articles in Volume 2 are "must" reading for pilots who routinely run engines and propellers at above-redline rpm (and yes, I did that too). Go into it with your eyes open. Pay particular attention to the graphs showing propeller resonant modes versus rpm for the commonly used Sensenich 76EM8 series of aluminum propellers. One of the articles contains excellent advice on the maintenance and inspection of aluminum propellers.

Lastly, we, and/or the manufacturers of our aircraft, have a choice of propeller blade materials. Virtually all constant-speed hubs are aluminum, but blades and fixed-pitch props may be aluminum, wood, or various types of composites. It has been well-established that wood or composite blades are lighter than aluminum. Aside from the obvious (the weight), there is gyroscopic precessional force to think about. We have all experienced the forces generated by a toy gyroscope when we try to rotate the spinning wheel in any direction other than around its axis of rotation. We've probably all noticed that when we pull the stick back on our (you name it, but the Pitts is the winner here) aircraft, the nose pulls to the right (unless it's Russian). The lighter blades of a composite propeller drastically reduce the gyroscopic precessional forces that the propeller applies to the crankshaft, the engine, and the engine mounts. If you are working a metal propeller hard, it would be wise to review the many articles relating to crankshaft and flange failure sprinkled through the four *Technical Tips Manuals*. Suffice it to say that hard aerobatics with a metal prop and the thin flange on an O-290G crank is pretty edgy.

Take care of that prop. Fly safely! *IAC*

LETTER TO THE EDITOR

More Chapter Content

Very nice edition of SA (Jan).

Especially stories by Mark and Jason. Somewhat reminiscent of early IAC years. Seems like it would be nice to present a contest from somewhere in the U.S. . . . in the magazine.

Narrative, photos, results . . . not all chapters would be willing to put forth the effort. Most likely, 12 would. It would be a chapter highlight column, an advertisement in a way.

As you know, there was a time when all results were published in SA. With the web postings now, this is not needed.

I am completely computer literate, but as a chapter president and newsletter editor in the '90s, I learned that some members are not and don't have the urge to use the Internet as most of us do. Chapter goings-on with results are interesting to prospective members as well as members.

The aircraft description in Jason's article was very good, very informative. Perhaps an equally good aircraft article could be in SA more often.

Regards,
Paul Logue,
IAC 1247

Thank you, Paul. We are always looking for material from IAC chapters, and we encourage chapters to submit highlights, as well as summaries of chapter contests and other events—especially photos.

Thank You for Sharing—Ed.

With Respect for JP Donnenfield

I am writing in response to "The Article He Could Not Write" by the widow of JP Donnenfield as published in the March 2014 issue of Sport Aerobatics. I was completely unaware of the G-LOC condition/affliction. More so, I was struck by the tender openness Ms. Lunde showed while sharing her story and the results of her research. If only the rest of us could be so bold in the face of terrible tragedy. I pray that she may take some small solace in the fact that at least one pilot, this father of two young children, has heeded her call. JP would be proud of his wife.

Respectfully,
Anthony Nichols

The photo captions in "The Article He Could Not Write" (March 2014) incorrectly used Lunde, the author's maiden name, instead of Donnenfield, the author's married name, to identify her deceased husband, JP Donnenfield.—Ed

This listing belonged in the aerobatic school listing in the April issue:

Dylan Aviation, Inc. X58 -Indiantown, FL
Phone: 772-485-6761
Email: jim@dylanaviation.com com
Web: www.dylanaviation.com
Aircraft: Super Decathlon
Courses:Tailwheel endorsement, Stall/spin recovery, Unusual attitude/upset training,Recreational aerobatics, Competition aerobatics, Pitts checkout
Location - Country airport in S. Florida; Instruction from a Master CFI-Aerobatic; Fly a Super Decathlon. Proven training syllabus.
Instructors: Jim AlsipMCFI-A

Mark your calendars for these upcoming contests. For a complete list of contests and for the most up-to-date contest calendar, visit **www.IAC.org**. *If your chapter is hosting a contest, be sure to let the world know by posting your event on the IAC website.*

Duel In The Desert
Friday, May 2 – Saturday, May 3, 2014
Glider Categories: Sportsman through Unlimited
Power: Primary through Unlimited
Location: Apple Valley Airport (APV): Apple Valley, CA
Region: Southwest
Contest Director: Chris Olmsted
Contact Information: 831-334-7232
E-Mail: *chris@olmstedaviation.com*

Ben Lowell Aerial Confrontation
Friday, May 23 – Sunday, May 25, 2014
Practice/Registration: Friday, May 23
Power: Primary through Unlimited
Location: Sterling Municipal Airport (STK), Sterling, CO
Region: Mid-America
Contest Director: DJ Molny
Contact Information: 303-619-4814
E-Mail: *djmolny@gmail.com*
Website: *www.iac12.org*

Best Box in Texas
Friday, May 30 – Sunday, June 1, 2014
Practice/Regist: Saturday, May 24-Thursday, May 29
Rain/Weather: Sunday, June 1
Power: Primary through Unlimited
Location: Jackson County (26R), Edna, TX
Region: South Central
Contest Director: Gary Walker
Contact Information: 832-656-8314
E-Mail: *gawwalker@aol.com*

Wildwoods AcroBlast
Friday, May 30 – Sunday, June 1, 2014
Practice/Registration: Friday, May 30
Power: Primary through Unlimited
Location: Cape May County (WWD) Lower Township, NJ
Region: Northeast
Contest Director: Dave Crescenzo
Contact Information: 609-517-0922
E-Mail: *dmolar@comcast.net*
Website: *www.iac58.org*

Coalinga Western Showdown
Friday, May 30 – Saturday, May 31, 2014
Practice/Registration: Thursday, May 29
Power: Primary through Unlimited
Location: New Coalinga Municipal Airport (C80): Coalinga, CA
Region: Southwest
Contest Director: Martin Price, Tom Myers
Contact Information: 510-579-3407
E-Mail: *martin@pull.gs*
Website: *http://www.iac38.org*

IAC Open East Championship – Ohio Aerobatic Open 2014
Friday, June 13 – Sunday, June 15, 2014
Practice/Registration: Thursday, June 12
Rain/Weather: Sunday, June 15
Power: Primary through Unlimited
Location: Bellefontaine Regional Airport (EDJ), Bellefontaine, OH
Region: Mid-America
Contest Director: Chris Keegan
Contact Information: 614-890-9711
E-Mail: *sdavis_1985@yahoo.com*
Website: *iac34.com*

Lone Star Aerobatic Championships
Friday, June 20 – Sunday, June 22, 2014
Practice/Registration: Thursday, June 19-Friday, June 20
Power: Primary through Unlimited
Location: North Texas Regional (GYI): Sherman, TX
Region: Mid-America
Contest Director: Kathleen Kyer
Contact Information: 972-365-8767
Alternate Phone: 903-378-7827
E-Mail: *Kateflies8@aol.com*

Midwest Aerobatic Championship
Friday, June 20 – Sunday, June 22, 2014
Practice/Registration: Friday, June 20
Power: Primary through Unlimited
Location: Seward Municipal (SWT), Seward, NE
Region: Mid-America
Contest Director: David Moll
Contact Information: 402-613-5422
E-Mail: *davidmoll66@gmail.com*

Apple Cup (Northwest)
Friday, June 27 – Saturday, June 28, 2014
Practice/Registration: Wednesday, June 25 – Thursday, June 26
Power: Primary through Unlimited
Location: Ephrata Municipal Airport (EPH): Ephrata, WA
Region: Northwest
Contest Director: Jerry Riedinger and Larry James
Contact Information: 425-985-9469
E-Mail: *JRiedinger@perkinscoie.com*
Website: *www.applecup.org*

Michigan Aerobatic Open
Saturday, June 28 – Sunday, June 29, 2014
Practice/Registration: Friday, June 27
Power: Primary through Unlimited
Location: Jackson County Airport–Reynolds Field (JXN), Jackson, MI
Region: Mid-America
Contest Director: Brian Roodvoets
Contact Information: 810-667-0642
E-Mail: *redfoot@usol.com*
Website: *iac88.eaachapter.org*

Green Mountain Aerobatics Contest (GMAC)
Friday, July 11 – Sunday, July 13, 2014
Practice/Registration: Thursday, July 10 – Friday, July 11
Glider Categories: Sportsman through Unlimited
Power: Primary through Unlimited
Location: Springfield Hartness Airport (VSF), Springfield VT
Region: Northeast
Contest Director: Bill Gordon
Contact Information: 802-585-0366
E-Mail: *wsgordon@earthlink.net*

Doug Yost Challenge
Saturday, July 19 – Sunday, July 20, 2014
Practice/Registration: Thursday, July 17 – Friday, July 18
Power: Primary through Unlimited
Location: Spencer Muni (SPW), Spencer, Iowa
Region: Mid-America
Contest Director: Dan Pichelman
Contact Information: 612-386-0352
E-Mail: *dan.pichelman@swivity.com*

CanAm Challenge
Friday, July 25 – Saturday, July 26, 2014
Practice/Registration: Thursday, July 24
Power: Primary through Unlimited
Location: Cut Bank International (CTB), Cut Bank, MT
Region: Northwest
Contest Director: Christopher Branson
Contact Information: 503-501-1496
E-Mail: *flyhran@aol.com*

2014 Election

NOTICE OF ELECTION

Monday, May 12 through Tuesday, July 29

The IAC Board of Directors invites members to vote in the 2014 Election for Club Officers and Directors. Balloting opens on Monday, May 12 at 9:00 a.m. CDT and closes on Tuesday, July 29 at 5:00 p.m. CDT. Ballots must be received before closing to be counted.

We encourage members to vote securely online at *www.iac.org/2014-board-election*. Voting via the IAC website requires logging in using a member-specific username and password. Our Webmaster(*webmaster@iac.org*) can provide any assistance needed.

Members unable to vote online may use the enclosed paper ballot instead.

A member may not vote in this election in person at the annual meeting; it must be done via ballot.

A Presidential-appointed Ballot Certification Committee will tabulate the election results and announce the election outcome at the annual meeting of members on Friday, August 1, 2014.

By Order of the Board of Directors,
Lynne Stoltenberg
IAC Ballot Certification Committee Chair

Mike Heuer — President

It has been my honor to serve the IAC as an officer, director, and volunteer for most of our organization's life and I ask for your support in this year's election. I have a wide range of experience in the sport, ranging from the "grass roots" level, as a former chapter president, up to international competition. In the pages of this brochure, you will read about the qualifications each candidate brings to this election but I also would like to lay out for you, very briefly, what I see in the future if elected President.

First of all to my qualifications:

Former IAC President, Executive Director, Treasurer, and member of the Board of Directors. Currently IAC Vice President.

Former Chapter President, Contest Director, National Judge, and Chief Judge at the IAC Championships and US Nationals.

Competition pilot. First contest in 1968 in Primary (now called Sportsman) progressing through the ranks to Advanced. In those years, I flew a wide range of aerobatic aircraft including a Ryan ST-A, Pitts S-1S, Extra 230, and Pitts S-2B. I helped build the Pitts S-1S I flew in Advanced (N442X). That aircraft now rests in the EAA AirVenture Museum in Oshkosh.

Editor of *Sport Aerobatics* magazine for three separate terms.

IAC's historian, unofficially and officially, since the IAC's foundation in 1970. I am an aerobatic history enthusiast who over the years has collected hundreds of documents, books, brochures, photographs, magazines, and other memorabilia covering all aspects of our sport. Writing a book about the history of aerobatics is part of my plan for the future.

Author and contributor to *Sport Aerobatics* and EAA's *Sport Aviation* magazines. Over the last forty years, I have contributed over 300 articles to those two magazines. As both historian and IAC member, I will continue to contribute to our club's magazine and will increase those contributions in the months and years ahead.

Aside from my involvement in IAC, I have been active in air sports organizations that make up the mosaic of sport aviation worldwide. Formerly a member of the Board of the NAA, the Executive Board of the FAI in Switzerland, and USA's Delegate to CIVA (the FAI's aerobatics commission), and for 14 years, a member of EAA's Board of Directors. I understand how these organizations all work together to benefit sport aviation.

In recognition of my contributions to aerobatics and sport aviation, I was inducted into the International Aerobatics Hall of Fame in Oshkosh and am a winner of the EAA President's Award, the Frank Price Trophy, the L. Paul Soucy Aerobatic Award for competition flying, the IAC President's Award three times and most recently, the FAI's Silver Medal for contributions to air sports worldwide.

These are my qualifications but of greater importance to IAC and aerobatics are what I would do as IAC President and what value my service would bring to the membership.

While active in the sport in various capacities – both

as an organizer, a judge, and a pilot – I also bring to the table experience and skill in administration, finance, and non-profit association management. A skilled leader of IAC, backed by a strong and motivated Board of Directors and the people who serve as volunteers in IAC's various programs, is necessary if we are to grow and prosper.

To say that IAC faces challenges in the future is an understatement. We have suffered from a long decline in membership and this has greatly affected our finances and impacted membership services. IAC's membership must be stabilized and grown if we are to offer you, the member, the kinds of services and support we have in the past. Here are some things I propose:

Put more emphasis, energy, and funding into membership recruitment and retention. Our membership chairman has proposed many ideas but they need support at the Board level and implementation. Without a better renewal rate than what we are experiencing today, along with an influx of new members, we will not continue in the form we have known in the past.

An expanded and improved *Sport Aerobatics* magazine. It is the one IAC product and service that reaches every member, every month. During IAC's peak years, it was almost double in size compared to today. We can achieve that again – with a growing membership and careful financial management.

More communications with members and Chapters. I would like to beef up our digital newsletter, "In the Loop" with more content and to revive a newsletter to Chapters that I used to produce called "K-Factor." Chapters need up-to-date information and more interaction with leadership. You are the folks in the field who are the basis of our sport. Communication must be two-way, beneficial, informative, and frequent.

A top-to-bottom review of all IAC's finances and programs to ensure we are doing our best to provide the best membership services. Part of this is a constant recruiting effort to bring new people and talent into our committees.

Making any volunteer organization work is only possible by getting the right people in the right positions. Since our responsibilities extend from the local chapters all the way to US team participation in world competitions, this is a huge challenge for leadership. I believe I can reinforce and build a team of people that can serve you well.

A friend once told me that communication is 90% of leadership. In addition to the points above, I pledge this to you if elected President: your phone calls, e-mails, and text messages will always be answered—and quickly. I enjoy solving problems, helping members, and making your membership in IAC enjoyable and worthwhile. My home number is (901) 850-1301 or e-mail *mike@mheuer.com* with questions or comments.

On a personal note, I am a retired airline pilot and hold an ATP as well as A&P license and USAF Command Pilot rating. I have about 26,000 hours of flying time in several dozen types of aircraft and reside in the Memphis, Tennessee area.

Lynn Bowes — Secretary

I am a private pilot, earning that license in June of 1979, and since that time I have owned and restored two aircraft—a 1946 Aeronca Champ and a 1941 Ryan PT-22. I attended my first contest in the summer of 1985 in Ottawa, Kansas. The flying intrigued me but the people hooked me. I joined IAC15 in Kansas City in 1985 and became a Regional Judge in 1986, National Judge shortly thereafter. In 1996, I moved to Lincoln, Nebraska, and joined the Midwest Aerobatic Club IAC 80. In both chapters I have been Chief Judge, Contest Director, Line Judge, Runner, Volunteer Coordinator, Newsletter Editor, Chief Cook and Corner Judge, always falling on the side of activity.

I have served as a Director since Spring of 2011 when I was appointed Director-at-Large and elected Director at the following election in 2012. I have maintained contact with chapters in my South Central Region and believe I have done a good job staying connected, asking for input and reporting results.

I have been the Chair of the Collegiate Program since 2012 and truly enjoy promoting that energetic, youth-focused program. If there was ever an embodiment of what we term 'grass roots aerobatics', this is it and the enthusiasm of the competitors is infectious. Precision aerobatics is basic to being a good pilot and I believe that all pilots should be taught the basic understanding of how to control their aircraft in any attitude. I have submitted a number of articles to *Sport Aerobatics* supporting the Collegiate Program and will continue to do so.

Last year I was honored to be chosen the Registrar for the 27th World Aerobatic Contest held in October 2013, in Sherman, Texas. This position required me to build and maintain a system for accepting team and individual competitor entries from 17 countries, communicate clearly with individuals who spoke little English, badge over 500 volunteers, and establish an office for all communication and distribution of contest paperwork. Without focus and a detail-oriented mindset this would have been an extremely difficult task. However, during the year prior to and including those two plus weeks in Texas, I forged new friendships, ran a tight WAC Office and I am extremely proud of my work.

Having attended every Board Meeting as a Director for the past three years, I have had the opportunity to observe our present Secretary who has set the bar

high for the office. His contribution to the IAC is immeasurable and his work impeccable. I am confident that I have his support and hope he will stand with me in answering whatever questions may arise as we make the transition.

If elected Secretary for the IAC, I will accept the new responsibilities of the position yet maintain my relationships with the members in the Chapters I have represented for three years. I believe that the IAC has miles to go in generating new members and retaining membership as well as getting real results on the programs that will further membership retention. As the aerobatic division of the EAA, I believe that the IAC must promote itself as the aerobatic expert it is and work with the EAA staff to promote our programs for growth.

I believe in putting maximum energy into the IAC.

I am married to Advanced competitor Ed Bowes, and we live happily on a farmette north of Lincoln, Nebraska, where we race go-karts and still play with hotrods and motorcycles.

Bruce Ballew — Director

I have been the Mid-America Regional Director for the past three years and am running again for a Director position with the IAC. I am an active aerobatic pilot and instructor in the St. Louis area. I am a corporate pilot with a Fortune 500 company in St. Louis.

As the Mid-America Director, I have been extensively involved with issues related to protecting our rights, as an organization, to use the airspace for our sport. I would like to see more effort and activities directed toward grass roots and noncompetitive aerobatics as I think that would add to the IAC and bring more people to aerobatic flying.

Gray Brandt — Director

I have been flying competition aerobatics since 2004 and have been on the Board of Directors for IAC Chapter 36, located in San Diego, CA, since 2005. I was Chapter Secretary for three years and President for four years. I am an active competitor in Advanced and also a CFI-I/CFIME/AGI, specializing in tailwheel, aerobatic, and formation flying.

Over the last seven years we have steadily been able to grow our membership in IAC Chapter 36, reaching a decades high membership level last year. I have worked closely with the local community and airport to preserve an incredible 39 year old permanently waivered aerobatic box located next to the airport runway. We ran into noise complaints, like aerobatic boxes around the country, but by working closely with the Chamber of Commerce, Rotary Club, American Legion, and the local elementary school and chapter is now a valued member of the community. IAC Chapter 36 can look forward to flying aerobatics and hosting competitions in the box for another 30 years. Preserving the Borrego box provides a safe place for local aerobatic schools and pilots to train and has produced continued growth for our chapter and also IAC membership in general in our area.

I think it is important for chapters around the country to share what works and what does not work to benefit all IAC members and increase contest attendance. Our part of the country has a large number of IAC members and California is home to six contests every year. It is therefore important that Southern California, which is a very active hub of aerobatics, be represented on the IAC Board of Directors. I would like to bring to the IAC Board of Directors some of the ideas that have worked for us, which include actively preserving practice areas and changes implemented at our contests that have been very well received by competitors. In turn I hope to bring back to California ideas from the rest of the country.

This year I will also be the Contest Director for the 2014 U.S. National Championships.

Thank you for your consideration.

Marty Flournoy — Director

I am asking for your support to elect me to serve on our board. I want to assist in the leadership of our IAC organization at the National level. I have been actively involved in competition and judging since 1996, first as a pilot, then as a judge, at regional and National contests. Like many members, competition began in a Citabria and then in a Pitts, which I still keep to instruct aerobatics and spin training with. Most recently I was selected for the Advanced Team for the Advanced World contest in 2012 and this year.

Over the years, by organizing, judging, competing and as Contest Director for Chapter events I have a learned the importance of the fellowship and professional standards we maintain through a dedicated all-volunteer club. These volunteers are key to the future of our sport and I firmly support and want our club to be one of inclusion, that encourages more practices within the local chapters to retain and recruit new members.Our judges are the backbone of our competitions and we should make the process of becoming a judge and staying current easier.

Our job as Regional and National pilots and judges can sometime make us so focused on performance that we overlook the fact that the majority of our

members actually do aerobatics for fun and are not competition oriented.

I look forward to working with other dedicated leaders to help strengthen our organization from the ground up.

Rob Holland — Director

I have never known a time where I was not completely obsessed with Aviation and Aerobatics. At a young age my Dad brought me to an airshow where I saw an airplane flying upside down, and knew that was what I HAD to do.

I have been flying since the age of 18 and have accumulated greater than 11,000 hours of flight time in over 168 different types of aircraft ranging from Piper Cubs to Regional Transport Aircraft, gliders to high performance aerobatic machines.

I graduated from Daniel Webster College in 1997 with a Bachelor of Science degree in Aviation Management and a Bachelor of Science degree in Aviation Flight Operations.

I am rated as an Airline Transport Pilot (ATP) with a Certified Flight and Ground Instructor (CFI, CFII, IGI, AGI) rating and also hold a glider rating. I have had a diverse aviation career so far: flight instructor, banner tow pilot, aircraft ferry pilot, Pilatus PC-12 corporate pilot, and commuter airline pilot. I currently work full time both domestically and abroad as an professional airshow pilot and an aerobatic flight instructor. Also I am an ICAS Aerobatic Competency Evaluator and also serve as a member of the ICAS ACE committee.

Here is a list of my distinguished aerobatic achievements:

2012 Art Scholl Award for Showmanship
2011, 2012, 2013 US National Aerobatic Champion
2011, 2013 World Freestyle Champion
2008, 2011, 2012, 2013 US Freestyle Champion
2008 World Advanced Aerobatic Champion
2006 World Advanced Silver Medalist
Two time member of US Unlimited Aerobatic Team
Three time member of US Advanced Aerobatic Team

If elected, I will work hard to represent the interest of the membership of IAC.

Doug Lovell — Director

Thank you to all who voted for me for Vice President last year. Losing that election to Mike Heuer gave me a year break from our Board of Directors. I'd like you to vote me back. I love this sport. I love the people in it. I relish the opportunity to care for this club.

You can learn about me in great detail at LinkedIn (*www.linkedin.com/in/dclovell*) and from my aerobatics page (*www.wbreeze.com/aero.html*). Briefly, I started as a judges assistant in 2002, worked up to National Judge, competed regionally up to Advanced, and have served at our Nationals contest over the years as Judge, Contest Director, Scorekeeper, and Jury Chair. I work as a pilot and have a software development studio that is currently me, a few consultants, and one project, *myFltTime.com*.

As a Director, I was your Board representative for the web and computer scoring committees. Your Board has referenced my technical background for many projects, including the *IAC.org* web site, the aerobatic schools listing (*www.iacusn.org/schools*), and our contest data and judge metrics (*iaccdb.iac.org*). You will find me in the IAC "yellow pages" (*www.iac.org/yellow-pages*) as chair of our Web Operating Group, where I work closely with our webmaster, D.J. Molny, and as a member of our Technical Committee.

I will honor your trust and represent the best interests of IAC. I'll continue to be there for you—present, involved, attentive, engaged, and committed. Please select me for Director. Get in touch any time. I enjoy hearing from you.

Debby Rihn-Harvey — Director

It's that time of year again that you select YOUR Board of Directors. I would, once again, like to ask for your support and allow me to continue to represent you on the Board. I will continue to be a voice for all members, from grass roots to the international level. There have been many issues in the past few years with airspace, noise, practice waivers, and category creep. We have addressed many of these issues in the past two years but have more work to do with these as well as that of membership, the magazine and having a strong international representation.

For those who may not be familiar, I will try to be brief on my background. I have been involved in aviation my entire life, being the third generation of aviators in my family. However, when starting aerobatics in 1978 my family thought I had lost my mind. I guess I have, because now it is my passion. I began competition in 1980. On a regional level, I am currently and have held many offices within Chapter 25 (Houston). I have been contest director for several regional contests as well as working all positions necessary during contests. Nationally, I have been a judges' school instructor and am currently an active National Judge.

Since first qualifying for the USA Unlimited Aerobatic Team in 1983, I have had the honor of representing the US in fifteen (15) World Championships over a 31-year period. Internationally, I represent the United States as

an alternate delegate to CIVA.

My passion goes beyond just that of the IAC. It also includes teaching, coaching, encouraging, and promoting aviation. I have owned and managed a fixed base operation since 1979, with an emphasis on aerobatics and safety proficiency training. My other jobs include being an FAA Designated Examiner, an ICAS Aerobatic Competency Evaluator, an airshow pilot and an airline pilot.

If re-elected, I promise to continue being a voice for the membership. Being actively involved in all aspects and levels of the sport, I understand your concerns. Through business and competition I have had many of the problems that each of you have experienced. I feel it is important to have continuity of leadership and a vast knowledge of the past history of the club. There is much work to be done, but together we can make this the best aerobatic club possible.

Thanks for your consideration!!

John Smutny — Director

Aerobatics has been integral to my flying since the very beginning. When I was learning to fly in the 1980s, it was in a Cessna 150 Aerobat. One lesson consisted of a few loops and rolls, with the ubiquitous, "Don't do this on your own!" Yeah, right. My first log book was filled with training flights where I practiced "spins."

After a short break from flying in the early 1990s, aerobatics once again lured me back into the cockpit, when I was at an air show and I chased down a performer with an IAC patch on his jacket and asked how I could connect with the IAC. We talked for a bit and he provided me contact information for my local chapter (Thanks, Don!).

My first competition was in 1997, with a rented Decathlon and a Safety Pilot. In 2000, I received the opportunity to become a member of a Christen Eagle II partnership. Then in 2011, I was lucky enough to acquire the Wolf Pitts. I'm currently an Intermediate competitor and usually attend four contests a year, including Nationals.

I've been a Regional Judge since 2006 and became a National Judge in 2011. Since 2006, I've tried to be a Contest Director for at least one Regional contest every year, and in 2013 was the Contest Director for both the inaugural IAC Open West Championships and the US National Aerobatic Championships. For the 2008 AWAC (now WAAC) competition held in Pendleton, Oregon, I was an organizing director, supporting the lead-up activities to the competition and putting on the air show afterwards. Since 1997, I've participated in over 45 competitions, whether as a competitor, volunteer, contest director, or judge. I'm committed to our sport of aerobatics.

Outside of the IAC, I own a business that works with local and regional government. I also provide air boss services to a number of air shows and events in the Northwest. From 2010 through the end of 2013, I sat as President on the board of the Arlington Fly In and continue as their Air Operations Manager.

My desire is for the IAC is to become the premier sport aviation club—whether your goals are competitive domination, recreational aerobatics, judging or just supporting your spouse or friend in their endeavors. Recent membership drive projects by Northwest chapters have shown an interest in aerobatics by the flying community, a desire to find local training and knowledge, but not as much interest to jump immediately into competition. Our own membership numbers, where roughly 10% are actual competitors, reinforce that fact. However, the IAC can be relevant to the casual aerobat—we have the knowledge to help every pilot reach their goals—and we need to reinforce this for the flying community. We are lacking consistent programs across our chapter network to communicate that message to pilots. From these recreational pilots we will undoubtedly get some competitors, but we should also be about the fun of flight, not just the trophy. One of my goals is to expand membership among those not immediately interested in competition. The IAC is the keystone of the aerobatic community and we should strive to welcome everyone, whether they are competitive or hobbyist pilots. I want to ensure that the IAC is an inclusive organization for all aerobatic pilots.

The IAC should help guide individual members and chapters to create opportunities for training, aircraft partnerships, aerobatic boxes, and improved volunteer recognition. My goal is to create a stronger, richer IAC experience for all members. *IAC*

NOTICE OF ANNUAL MEETING

Friday, August 1, 2014

The International Aerobatic Club will hold its annual meeting of members on Friday, August 1, 2014 in Nature Center Event Tent #1 on the EAA AirVenture Oshkosh convention grounds in Oshkosh, Wisconsin. Doors will open at 6:00 p.m. The meeting will begin promptly at 6:30.

The meeting agenda is:

- Receive the President's Report
- Receive the Treasurer's Report
- Conduct old business
- Conduct new business
- Receive the results of elections for President, Secretary and three Directors

There will be ample opportunity to socialize with fellow IAC members. Complimentary food and drink will be served.

What We Learned About Farming From That

TODD ASHCRAFT'S ACCOUNT

My disclaimer: I have had a bunch of really smart folks and great pilots help me try to figure out what I could have done better. We haven't come up with much, and you can second-guess me all you want, but don't bug me about it. I already know luck was THE major factor. Lastly, those of you who take offense at the humorous way I've written my story, please be sure it does not matter to me. I'm here and fine, and so is my passenger.

The plan was to fly to a small airport about 40 miles north of my home base, where I was going to do the Sportsman aerobatic sequence in front of a crowd, some judges, and even the FAA. While I would wait for my flight, Andrew would take the airplane up to a different local airport and do pretty much the same thing in front of another bunch of judges and some folks who offered to coach. This is why we were wearing our chutes on what would otherwise have been a very uneventful flight.

About 10 minutes after departing our tower-controlled home airport, my partner says, "Dude, oil pressure." So I look again (I had just scanned around his head to see the gauges) and stared dumbfounded at the oil pressure gauge which was reading very low, but not zero.

I did a 180 back toward home and started looking for better ideas. Finding none, I called the tower and declared a precautionary landing. They cleared me for any runway, and I told them I'd like to make it to 9-27, but I might have to change my mind later. Then I started my run back toward the airport, which was actually past what you might call a no-man's land of quarries, forests, and hills. During this portion of the flight, I had an internal struggle between climbing higher and descending towards home. The vision of me being at 5,000 feet over the end of the runway and exploding into a fiery ball made me stick with what I had; I stayed at about 2,300 feet AGL.

Trying to make it back but keeping an eye on the gauges and the very limited emergency fields to put down in, I waited for things to get better or worse. They got worse. The engine started losing power, and there was no way we would glide it back to the airport. Biplanes like the Eagle glide about as well as you would with a bunch of flying wires and stuff hanging off of you.

I called up the tower and told him we were declaring an emergency and putting it down in a field. The field (Andrew saw it first) looked beautiful, like a sod farm that had been harvested leaving a light brown dirt square just big enough to put down in. I tried to make that field, leaving the engine to help with some intermittent power if it felt like it. Of course, I had one hand on the throttle ready to deal with a busted prop, or a thrown rod, or whatever. Bits of the various articles I'd read in the past about engines flying off the front of airplanes due to vibration floated through my mind. Yes, I squawked 7700 and all the rest of that stuff, too.

As we tried to make the chosen field, we got a bunch of smoke in the cockpit next. I told my partner to get ready to get out. I told the tower we had smoke in the cockpit, which was the last they heard from me (pretty inconsiderate in retrospect—I should have at least mentioned the revised plan to depart the aircraft). Right about that time, the engine made a big "bang!" and started to shake the airplane violently. So, not only could I not see the panel through the smoke, but also I couldn't read the gauges with all the shaking. I was ready, though, and yanked the throttle to idle pretty darn quickly.

This is where a lot more stuff went through my head, but the short version is I decided we had to get out of the airplane.

I yelled at Andrew (sitting in front, remember) to watch his head and I

pulled the canopy jettison handle. The canopy absolutely failed to do exactly as planned. Instead of flipping away leading-edge-up and getting clear of us, it kind of sat there bouncing slightly along on top of the fuselage. In retrospect I swear it was making little teasing noises like, "Whatcha gonna do now, dumb ass?" So I pushed up on the only part of it I could reach with my left hand/arm above my head.

Of course, when I did this, the front edge flew at me as the bubble left. It hit me square on the right side of the headset. I think maybe it busted my David Clarks at that point, but I was a little busy. So I yelled about a dozen times "GET OUT" to Andrew and waited for him to do so. He had a little trouble getting out, maybe due to the belts or headset or something.

He must have gotten his headset troubles worked out because they also hit me on the way past. So, before I got hit with anything bigger (like him), I finally got smart enough to duck. He went sailing over me. He got out around, maybe, 1,000 feet AGL.

Then it was my turn. I had to let go of the stick to unlatch my harness because one lever goes right and the other goes left (safety reasons!). I learned something valuable. When the front seat of a tandem, rear-seat solo Eagle II suddenly gets empty, and the canopy isn't on the airplane anymore, and the airplane is trimmed for cruise with power before everything hits the fan, there will be a nose-down tendency if you let go. Another important lesson-I think I tensed up my legs so much trying to get out that I loaded up my harness and made it tougher to unlatch. So, when you are in such a situation, try to relax. It might make releasing your harness easier.

With all the smoke, shaking, loss of power, wind, harness problems, and hits to the head, I did not have much altitude left. My first clue was seeing green out the sides of my peripheral vision. Once I got the harness unlatched, I grabbed the rip cord with my right hand and pushed on the stick with my left. My theory was I could pop myself out the top of the airplane. When I got the circle where the spring is for the

pilot chute clear of the turtledeck behind me, I would yank the rip cord and close my eyes, so I wouldn't have to see whatever was next (I'm a chicken!).

All of it worked. Especially the closing-the-eyes part. Andrew told me later he figured I got out at about 100 feet AGL. I thought he was wrong, maybe due to him being excited, hanging from his own chute, being far away, and since I wasn't dead. When I brought the chute to my rigger, he figured I got out at somewhere between 100 and 200 feet. He found black paint on the pilot chute fabric and the strap that runs from the pilot chute to the main canopy. This paint came from the black front face of the turtledeck that I was hoping to miss when I pulled the cord. Close call.

I received a hairline fracture of my L1 vertebra and a slightly tender tailbone. Not bad for getting hit with a planet in the back! I also have a photo of the hole my body left in the soybeans, where I landed 10 to 12 feet from the top-right wing tip of the Eagle, which hit about 75 to 80 degrees nose-down. A friend from work found my rip cord, 20 to 25 feet farther back on course from the wreck, which was ironically about 200 yards from the intended emergency landing spot. The insurance company has the remains of the airplane, which isn't saying much. I jokingly asked for the propeller, so I could have the only wall clock propeller that can be mounted around a comer.

The guy who packed our chutes is Julian Morgan from Sky Savers Rigging at Chicagoland Skydiving in Hinckley, Illinois. He saved our lives, and he and his wife are set for coffee (they don't drink alcohol) for as long as they wish. I felt really stupid giving them a signed photo of the wreck, when they are the ones who should be giving away autographs.

Of course, I will be buying Para-Phernalia Softies for as long as I need chutes, and I'm happy I already own another one for a homebuilt I'm working on. Julian told me that without a doubt, the excellent pack job and the specific model pilot chute that came in my Softie rig is what kept me from killing myself. Damage to the rig when I did the "Wile E. Coyote" into the beans (I landed flat on my back) was limited to a bunch of

popped threads where the container attaches to the harness and was likely due to the bag stopping on the beans and my body moving onward a couple feet.

I have the following list of considerations that we ought to address if we fly, build, do aerobatics, or design aerobatic airplanes. Not all of them are valid for all cases, of course, but they each deserve your thought.

1. Consider adding pitch-up trim in a tandem airplane that has both people aft of the CG once things start to go wrong. That would help counteract the nosedown pitching moments from losing so much mass aft of the CG. Think also about the mass of the canopy going away.

2. If the oil came out of the prop hub, or otherwise over the top of the cowl rather than blowing in as smoke through the firewall seals, nooks and crannies, we'd be burned, or blind, or dead or a combination of these. The Eagle has no fixed windshield, so once the canopy is gone, you are subject to whatever is blowing aft.

3. Why is the jettison handle on many of these aerobatic airplanes on the right, especially since we might use it instead of the throttle lever? It means letting go with your right hand (from the stick) to yank it. At a minimum, you have to swap hands. My homebuilt's handle is being moved to the left, and if anybody grabs it rather than the throttle, I will interest them in another hobby.

4. Our radio was mounted very low, in front of the stick. Tough to tune to 121.5, especially if your belts are tight or the airplane is shaking itself apart.

5. Good thing: When we left the tower's airspace, I turned the volume down but left the tower frequency dialed in. Try this if you have nobody else to talk or listen to. Bad thing: the volume knob is not much easier to deal with than the tuner. Maybe lowering the volume at the headset would be better, especially if you could wire the airplane and headsets to give you intercom and radio volume adjustments separately, or add a volume knob somewhere else (like the left side of the cockpit).

6. My homebuilt will also get a spring-loaded aluminum "flap" that will pop up after the canopy is unpinned. This way the hinge pins get pulled out of the canopy hinges first, then an air load on this flap that sticks up at the leading edge of the canopy will cause it to lift at the front and blow off cleanly. You could also think about spring loading the entire front of the canopy frame, depending on the design.

7. I know all the safety reasons for making my harness latches operate in two different directions. It is a good idea, but maybe a way to quick-release both latches when you really need it is possible. I know of no good way to do so and maintain the safety feature right now.

8. I wish there was a way to get all the benefits of rudder and/or elevator surface positioned forward of the hinge line without having the surface there get snagged as you depart the aircraft. This goes double for some Unlimited aerobatic airplanes with spades on the top of the rudder. The Eagle had no such surfaces.

9. There was a chance (later disproven during the tear-down inspection) that the failure was due to the 3-way valve of the inverted oil system getting a stray particle in it or sticking open due to galling or pitting of the two balls inside. Apparently, this has caused a few problems in the past, and folks who have been around awhile know about it. I wish we had a way to check the operation of the inverted oil system during a preflight, even if it was just some way to ensure the stuff was all floating freely and seating well. No ideas there, except be sure to follow the Christen manual to clean and maintain the valve and separator during the appropriate inspections.

10. I always got out of the airplane as if I were going to have to do so in a hurry. I never really thought during these "dress rehearsals" about doing it without looking down at my belts, or having to hold the stick against unknown forces due to a busted airplane. The practice is a good idea, but think about the various situations and attitudes in which you might have to depart the airplane.

11. I never wore a helmet in the Eagle since the one I own restricts my peripheral vision and limits the amount of head movement. It is the wrong kind for this style of flying. I'm looking at a new fighterstyle helmet (HGU-55) that has cutouts for better field of view and better range of neck bending. Wearing a helmet might have expedited my ejection after getting beat up by the canopy and the headset.

Again, thanks to Para-Phernalia for the Softies, Julian Morgan for the excellent pack job, Gary Douris at Freeflight Enterprises (who made the parachute canopies), Andrew for doing what had to be done as fast as anyone could, and my other partner in the airplane (who was on vacation at the time) who did not kill me when he heard about the wreck.

ANDREW HELFER'S ACCOUNT

Beautiful sky. Something that you can never get enough of if you're a pilot. No wind, maybe three small clouds in sight Beautiful day to fly. My partner, Todd Ashcraft, and I were ready for a fun-filled day in northern Illinois. He wanted to fly at a small airshow at Galt Allport, and I was going north for an aerobatic critique by my coach in Wisconsin.

The only problem was deciding who would be pilot in command (IC)and who would be passenger on the way up and back. I lost the toss, so Todd was PIC, and I got to be the baggage in the front. Taxiing out, we both remarked on how great the weather was. It was 8:10 in the morning and there was nobody around.

After run-up, we were cleared to take off on runway 27. Todd lifted the Eagle II off the runway so smoothly I didn't notice it until he pulled skyward. How does he do that, I wondered? I try to emulate his smooth takeoffs.

We climbed and turned north toward the Illinois/Wisconsin border. I love being a passenger. I don't have to worry about that whole flying thing, so I can really look and see the world. I saw emerald alfalfa, golden tips of corn, and there was even a farmer who cut patterns into his since we're the only ones who can see his work!

I remember the sky being this amazing shade of blue—a sapphire so perfect that even clouds know better than to show their faces. We spent time in the climb talking about what we'd be doing when we got to Galt and what we thought about landing there. It's a 36-foot - wide runway, meaning the only way you know you're lined up on the runway is when you can't see it. Todd told a funny story about some guys "doing" aerobatics, and I remember saying something about not trying stupid things like that. Still chuckling, I did my customary check of the instruments and what I saw cut my laughter short. There was no oil pressure.

"Oil pressure!" I barked, tapping the gauge.

"Oh, crap," Todd remarked.

This little dial did what it was supposed to do. It told us there was no oil going to the engine. This was a bad thing. (All those little hamsters in there need something cool to keep them from burning their feet.) At this point I did what many pilots do in their first emergency: I went into instant denial.

As Todd turned the airplane back toward the Aurora Airport, I tapped the oil pressure gauge and remarked, "I really hope this gauge is malfunctioning." "Me, too," Todd replied, and turning up the radio he called out something I'd never heard before, "This is Eagle96CG. PAN PAN!"

Pan Pan? What was this, an order for pizza? I had no clue what he was talking about, but it sure got Aurora tower's attention. "Say again, Eagle 96CG."

"PAN PAN!" Obviously, the first transmission wasn't a mistake, since Aurora immediately cleared us for whatever runway we wanted to use. I looked out past the nose and figured that Aurora had to be 8 or 9 miles away. Still tapping the oil pressure gauge, I came to the sickening realization that we weren't going to make it to the airport and I began looking around for anything resembling a private airstrip. There were none.

"I don't know if we're going to make the airport," I ventured.

"Let's just hope the engine lasts a little longer, we don't need much."

Being a little pessimistic, I started looking for smooth fields to land in. We were at about 2,500 MSL, which is about 1,800 feet above the ground, and those beautiful green fields suddenly became evil claws that would grab the landing gear of the Eagle and flip it on its back. The engine was still producing power, and we hadn't seen or heard anything bad yet, so until proven otherwise, I looked for a nice, flat field and assumed we'd make it home.

Brrrrooowwwp! Oh, crap. There goes the hub on the constant-speed prop. Since it works through oil pressure, the oil gauge was right and we were toast. It was about this time that my belly crawled up into my throat and certain parts of my anatomy puckered up. I think Todd was doing his own preparation because he had the presence of mind to talk to me.

"I like that yellow field to the left," Todd said.

"No. Brown field to the right. Three miles."

Brown field! Any good glider pilot will tell you that brown fields are the best, since they're usually fallow, smooth, and fairly firm. Because of this, glider pilots who land out (a common occurrence) usually look for brown fields first, followed by dark green, then light green or yellow. Not only could we make this brown field,

but it looked like there was a wheat field in front of it, giving us a pretty good chance of surviving a landing.

"Aurora Tower, 96CG is declaring an emergency. We're going to try to put it down in a field about seven miles northwest of the airport." While Todd's saying this, I'm tightening my shoulder harness and my belts even tighter. There was no way I was going to introduce my face to the instrument panel if we flipped. The adrenaline wasn't rushing too badly, and I was nowhere near panicked. Todd had about 600 hours in gliders and was a glider instructor. I had complete confidence in his ability to land the airplane. I was just not looking forward to the possibility of flipping the airplane. That's all that was on my mind at the moment.

Aurora Tower came on the radio.

"CG, How many souls on board?"

There was a pause.

"Two souls on board."

Todd didn't sound happy to say that, and neither was I. Another airplane in the area piped up and said it was turning toward our position to see if it could find us when we landed. Meanwhile, I'm checking the harness and watching the gauges. This time, I was eyeing the altimeter (now at 2,000 MSL) and the oil temperature. If it gets too hot, something's gonna blow or a fire is going to start. Todd kept mumbling "power full back" and I started thinking about what I'd tell my coach after we landed.

I smelled burning oil and then smoke filled the cockpit.

The one thing that frightens aviators more than anything else is being on fire. Airplanes burn really well, and even if you have a parachute, that's no guarantee of survival, since one lick of flame can put a lethal hole in a parachute, even when it's still on your back. We didn't have fire extinguishers like the big boys, and being made of wood and fabric, it wouldn't take much to turn the Eagle into a torch.

We heard this muffled poom! and the smell of burning oil got really strong. Everything seemed to slow down.

Todd said, "Screw this, we're getting out of here."

"Huh?"

The canopy opened and what Todd had just said hit me. We're bailing out! Holy cow! That's about all I could think, since I immediately ducked and started yanking on my buckles to release my harness. The canopy went away somewhere and Todd yelled, "Get out! Get out of the plane!" I felt the wind, but it didn't feel like much of anything. I stood up (on my seat) and almost had my head torn off by my headphones. Strange I the things you forget when you're busy trying to stay alive.

"Get the hell out of the plane!" yelled Todd almost casually. I reached up, grabbed the head pad of my headset and pulled it off. I felt something scrape my ears, but that was all far away. Later I realized that the headset was strapped to me, and that the scrape was two layers of skin being removed from my ears. I looked at the instrument panel and noticed that the altimeter was unwinding and saw it spin through 1,500, 1,400. I looked to the right and remember seeing Todd holding the stick, his mouth open yelling at me, and his Randolph Aviators sunglasses making him look like some kind of cop. I put my right foot on the right side rail of the cockpit and looked down.

Time slowed like something from *The Matrix*, and everything became crystal clear. I remember the black of the side rail, the dirty white of my right shoe. I remember seeing the green, green field below, and I could even see the crop rows. I felt the wind and something in my mind clicked. Everything somehow became totally and completely surreal, as if what was happening wasn't really happening to me-that I was merely watching it from above.

I pushed with my right leg and I floated out in space, truly flying for the first time in my entire life. Some tiny part of me felt that and screamed its freedom. The rest of me was working almost totally on instinct. Open your arms and legs; spread 'em wide! Don't let the airplane hit you or you're dead! Out of the corner of my eye, I saw the tail of the airplane drift from my right, behind me, to my left side. I was clear!

Your first aerobatic lesson always begins with the parachute and how to use it. I was hearing my instructor even as I was doing it.

"Visually acquire the ring."

There it was.

"Grab the ring with both hands."

As I grabbed the ring I started to tumble. Some fatalistic part of my mind realized either the parachute would work or it wouldn't.

"Pull your arms straight out, as far as they'll go."

I felt the ribs on the rip cord vibrate

against the container and heard the chute start to deploy. I grabbed my left wrist with my right, and as the chute slowed me, I watched the rip cord continue its plunge to the ground. The slowing wasn't as abrupt as I thought it would be, more like somebody trying to pull the waistband of your underwear up to your chin.

I'm glad I always tighten my chute straps. If they were loose, I don't know if I'd be able to have kids. Hearing the chute open was the second most wonderful thing I've ever experienced. Seeing that orange and white canopy over me was the first. Looking up I saw two orange tabs, and realized even round chutes have something to control them with. As this thought went through my head, I looked around for Todd's chute.

No chute. I got this sick feeling in my stomach as I realized he was still in the airplane. "Come on, come on, come on," I chanted to myself. The Eagle nosed over about 45 degrees and picked up speed. "Come on, come on, COME ON!" I shouted.

About 250 feet above the ground, I saw orange and white blossom on the side of the fuselage, but it looked too small to be the whole chute. Suddenly the whole chute opened and I saw it pull Todd out of the aircraft at something like 5O feet above the ground. As he separated from the airplane, I looked down to see how much time I had before landing. Plenty.

Before I could look up again, I heard this "CHUFF" sound and I saw the airplane sticking up out of the ground, with a parachute about 10 feet to the right. It had only taken a second to look at the ground and Todd was already down. I remember feeling slightly disappointed that the airplane didn't explode or something, like in the movies. Fearing the worst, I reached up and put my thumbs in the control tabs for the chute.

Guessing I was about six feet off the ground, I yanked the tabs for all I was worth and as my feet touched the ground, I relaxed. Hitting the ground wasn't much of a shock at all, maybe like jumping off a three-foot-high counter. When everything stopped

moving, I froze and tried to figure out whether I was injured. Other than a scratch on my knee (where did I get that?) and sore ears, I was totally unhurt. Todd! I exploded out of the parachute harness, jumped up, saw the Eagle sticking up out of the ground like some bizarre monument and started running as fast as I could.

Visions flashed through my mind about having to sit there and watch him die in front of me. About two-thirds of the way there, I saw him get up, look around, look at the airplane, put his hands on his hips, and start walking toward me. I was so relieved I stopped right there, then walked over to where he was.

"You okay?" I asked.

"My back hurts. How about you?"

"I'm fine." Fine now. We're all fine now.

A lot of the rest went by in a blur. Waiting for the search plane and waving to let them know we were all right . . . seeing the fire trucks and ambulance rolling across the field . . . going back for my parachute, since there was no way I was leaving it out there after it saved my life. Digging through the wreckage for my destroyed backpack and learning that my PDA had survived, even though my phone hadn't. Joking with Todd on the trip to the hospital (amazing how insistent EMTs get when they know you've been in an accident). Calling my dad and my coach in that order.

One thing I remembered clearly after the accident is going to Chicagoland Skydiving and talking to Julian, who had packed my chute. I almost broke down then. It's very hard to describe the incredible gratitude I felt toward this person whose skill meant that my one last chance to survive worked exactly like it was supposed to. He asked what kind of chute it was, and commented that Softie probably makes the best pilot chutes around. Pretty high praise from a guy that packs and uses parachutes for living. I'm convinced. Hope he likes all the coffee we sent him. It'll probably take him six years to drink it all.

I learned a lot of things about this experience:

1. Always think ahead. If something goes wrong, you don't want to get caught without any alternatives.

2. Give yourself alternatives. Until the smoke in the cockpit, we were planning on landing in a field, but we also had parachutes, in case things got worse.

3. Make a decision. Even a bad decision is better than no decision.

4. Don't hesitate. If you're unsure about your ability to land safely, get out! That's what parachutes are for. That's why I'm still here. I have a new airplane now. Only one seat, since I don't want to deal with the possibility of having to tell a nonpilot passenger to bail out for a while. Small, light, and aerobatic, since that's what I live for. It'll take me through the Advanced level without breaking a sweat. As long as I don't have to bail out again. Then again, that's what parachutes are for. IAC

Inverted Flat Spin World Record

Third time is a charm

by Spencer Suderman

On March 13, 2014, at 11:39 a.m. Pacific daylight time, a new world record for most inverted flat spins performed in one attempt was set when 81 full turns were completed in a Pitts S-2B. The old record of 78 turns was anything but easy to beat, and it took three attempts over the California desert to do it.

This spin was entered at 23,000 feet and the recovery initiated at 2,000 feet, 3 minutes and 15 seconds later, after which the plane returned to straight-and-level flight at 950 feet. This flight and all of its preparations were a data-driven exercise in the research and development of aircraft configuration, pilot performance, problem solving, and most important, flight safety.

Flight timeline:
10:39:24 Engine start
10:52:21 Takeoff clearance
10:52:33 Wheels up
11:36:06 Rolled inverted 23,000 ft
11:36:15 Spin entered 22,900 ft
11:39:21 79th turn completed at 2,600 ft!
11:39:27 Spin recovery initiated 2,100 ft
11:39:30 Vertical downline 1,700 ft
11:39:38 Level flight at 950 ft
11:45:48 Landing.

History

Attempt Number 1

On March 10, 2011, after departing from the Naval Air Facility (NAF) El Centro and climbing to 21,000 feet, then entering the spin at 20,500 feet, only 64 turns resulted.

Attempt Number 2

On December 8, 2013, after departing from NAF El Centro and climbing to 23,000 feet, an unsuccessful attempt was made to enter the spin, which resulted in falling out of the insipient phase of the maneuver, recovering at 20,000 feet, then climbing back up to 22,000 feet and entering the spin at 21,600 feet. Only 77 turns resulted, but this was still a big improvement from the previous attempt.

The gains in performance between the first two attempts were due purely to modifications on the engine and optimized tuning of the weight and balance of the plane for the intended purpose of the flight. The improvement in performance between attempts two and three were purely about how the flight was managed and the control inputs to enter the spin.

Understanding the Maneuver

While an in-depth discussion comparing and contrasting the different types of spins is beyond the scope of this article and has been written about in great detail by several other prolific pilots/authors, I will simply remind everyone that spins are either upright or inverted, and normal or accelerated and possibly aggravated. But in all cases other than an inverted or upright power-on flat spin, the airplane is still flying since there is lam-

Ready to go.

Landing.


Spin entry.

inar (smooth) flow over the wings and tail. That is why a normal upright or inverted spin can be accelerated by using the elevator to decrease the angle of attack. It is important to understand that during a power-on inverted flat spin, the plane is not flying but is simply falling and rotating due to thrust from the propeller, and there is no manipulation of the flight controls that will increase the rate of rotation. However, certain flight control positions will actually slow it down. Of this fact I am certain, because video-documented tufting research performed during numerous inverted flat spins indicates that this is the case and emphasizes the importance of proper flight control positioning for maximum rate of spin.

I have learned the inverted flat spin is largely misunderstood by most aerobatic pilots, and it requires a different way of thinking to understand what is happening and why. The biggest "Ah-ha!" moment for me came when I realized that the propeller drives the maneuver through asymmetric thrust about the longitudinal axis (nose to tail) rather than gyroscopic precession as I had thought.

When an airplane flies forward, all of the propeller blades make thrust because the disk of the prop is mostly perpendicular to the airflow through the propeller. During the inverted flat spin, the airplane is falling on its back (i.e., dropping toward the ground at 65 mph at 5,000 feet AGL) so the airflow is parallel to the disk of the propeller; and much like a helicopter in forward flight, one side of the disk has blades that are advancing into the airflow while the opposite side has blades that are retreating and approaching a condition known as "retreating blade stall." In effect they generate little or no thrust while the advancing blades generate most of the thrust—which is what drives the maneuver and explains why you can only do an inverted flat spin with right rudder in a Lycoming-powered airplane. After much experimentation (spins recorded on video) with various prop settings and throttle positions, it became apparent that high rpm and full throttle with the fuel flow (mixture) set for best power, 100 degrees rich of peak, provided the highest spin rates.

Anyone who spins airplanes should be extremely comfortable with how to recover from all types of spins using both a normal proactive method and an emergency method. It has been proved that either recovery method is virtually foolproof and perfectly reliable in the Pitts when executed correctly. PARE is the acronym for Power (off)–Aileron (neutral)–Rudder (opposite)–Elevator (to neutral) and is the normal proactive method that works particularly well on the recovery of inverted flat spins, which is important if you plan to recover low.

Having opened my air show performance for years with inverted flat spins that start at 4,500 feet with the recovery initiated at 2,000 feet, I have learned to perform PARE so quickly and precisely that I can go from a full power-on inverted flat spin to a vertical downline in 400 feet, then decide whether to pull out of that dive easy or hard as the situation calls for. In trying to break the inverted flat spin world record, I knew that after hanging inverted and spinning down at minus 1.5g (indicated on the g-meter) for upwards of three minutes would require an easy pull from the vertical after the recovery to avoid a high positive g excursion that would cause G-LOC (g-induced loss of consciousness).

Formulating the Plan—Engine Improvements

After Attempt Number 1, it was clear that in order to break the record I would need to start from a higher altitude and increase the rotation rate of the plane in the spin. Since reliable information about making planes spin faster seemed elusive, I turned my focus toward climbing higher. Aerobatic planes in general—and the Pitts in particular—are not made for high-altitude flight for a number of reasons, beginning with the symmetrical airfoil that is horrible at flying in thin air, to a large number of other design features that work well for low-altitude aerobatics but lose performance quickly as the air gets thin. When you start asking around about how to increase the service ceiling of an airplane, the answers seem to start with a discussion of increasing horsepower, then move on to metal propellers with thin tips. None of these options are available for a certificated aerobatic plane that is trying to break a record for inverted flat spinning and may also have a loose nut in the cockpit connecting the seat to the stick (wink).

In the interests of leaving no possibility on the table around the

metal versus composite prop question, I went flying in an S-2B that has the original Hartzell two-blade prop and learned that it spins 1/2 turn per 1,000 feet slower, documented with video of course, than an S-2B with the MT three-blade composite prop, so that put the metal prop idea to rest. This should come as no surprise since one of the many advantages of composite props in aerobatics is the lower gyroscopic rigidity in space due to the reduction in weight at the tips.

Now that I was focused on the engine, I called the man who knows more than anyone about aviating in the highest flight levels in a small piston-powered airplane—Bruce Bohannon. Bruce holds many world records, including the one I wanted to hear about the most: highest altitude (47,067 feet) for a piston airplane in Class C1.b (takeoff weight between 1,102 and 2,201 pounds). We talked about twin turbos, nitrous oxide injection, and all sorts of things that are almost guaranteed to turn expensive machinery into a boat anchor within a few hours of assembly, but they might be useful long enough to break a record. Of course the airplane itself is still the wrong airframe for this type of flying—but the right tool for the job of inverted flat spinning.

As the conversation meandered through the possibilities, we identified the biggest return on investment by advancing the magneto ignition timing from 25 degrees BTDC to 40 degrees BTDC, with the caveat that full power could only be applied after climbing through 10,000 feet or the engine would detonate itself on takeoff. The other consideration in this approach was managing the power on the rapid descent during the spin, and that would have been the biggest challenge. The other option would be electronic ignition with automatically variable timing. Nothing was on the market for the Lycoming IO-540 in a certificated plane at the time, so I considered learning how to precisely and quickly readjust the magnetos on a regular basis.

Around this time, in October of 2012, I read a press release from Electroair of Howell, Michigan, about developing an STC'd electronic ignition system for six-cylinder Lycoming engines to complement the STC already obtained on their system for four-cylinder engines. I called the president of the company and told him my story. I then listened to his story, and we decided to work together in a flight-test program that was written about in the August 2013 edition of *Sport Aerobatics* ("Flight Level 220 in a Pitts"). The rest is literally history now.

Formulating the Plan—Increasing Spin Rate

In early 2013 while waiting for delivery of the electronic ignition that was still a few months away, I turned my efforts toward increasing the spin rate by tuning weight and balance. Leaning heavily on my Drift Innovation HD video cameras, I documented spin rates at various altitudes when flying alone and with

a passenger in the front seat.

Anyone who has ever calculated the weight and balance (W&B) of a Pitts S-2B or S-2C with a normal-size adult passenger in the front seat understands the unspoken truth about flight training in a Pitts. As it turns out, the spin rates are faster with both seats occupied due to aft center of gravity (CG), but that is a lot of extra weight to drag up to altitude. And frankly, I'm not sure anyone else wants to go along for that ride. After a fair amount of experimentation, I figured out how to get the CG location to the aft edge of the envelope with minimal increase in weight—without sacrificing safety when it came time to recover from the maneuver in the accustomed manner.

Once the W&B problem was solved, I did a series of test flights in small blocks of altitude from very low to as high as practical in order to measure spin rates per 1,000 feet and build a spreadsheet model that could be used to predict through extrapolation the anticipated performance to 23,000 feet for a go/no-go decision about another attempt at the record.

My spreadsheet told me that if I could get to FL 230 and make a clean entry with a crisp recovery at 2,000 feet, then 83 turns would occur. Given that 81.75 turns were recorded, my calculations were only off by 1.5 percent.

Formulating the Plan—Coordinating the Flight

In the middle of September 2013, I contacted my friends at NAF El Centro and asked about the possibility of using their airspace in November to make Attempt Number 2. The mission of this Naval air facility is to accommodate fighter jets and attack helicopters for training activities on their bomb ranges, and of course, host the Blue Angels winter training. Everyone there is spring-loaded to say yes; this place is a "hotel" for aircraft and hospitality is everything. Helicopter squadrons from the U.S. Marine Corps and British and Danish forces come to El Centro to train in brownout conditions caused by the native desert sand.

My last attempt at breaking this record in 2011 was the same week as the annual air show, so all of the accommodations are already in place for civilians and their aircraft to be on base. After making my request to the base commanding officer, it was approved for early December, and I would have to arrange for my own fuel since avgas is nowhere to be found on a military base.

On a side note, the only reason that the Navy let me land on its normally-closed-to-the-public airfield and use its restricted airspace is because over the years that I have flown in its air show, it was demonstrated that my level of preparation, airmanship, and safety consciousness is becoming of an air show professional.

As I coordinated my flight for December 8, 2013, the plan called for me to depart Camarillo airport on Saturday, December 7, and first land at Imperial County Airport for fuel. I'd then make the final 5.5-mile leg to NAF El Centro and spend the night on base with my support crew and the official judges along with the president of Electroair, who all drove there on Saturday. I would then make my attempt at 9 a.m. Sunday morning.

As often happens in general aviation, the weather is the biggest factor in diverting the best laid plans, and I wasn't able to depart Camarillo airport on Saturday due to a severe wind event in El Centro. Everyone was there but me and my airplane. "Plan B" went into effect and I departed Camarillo at sunrise on Sunday—which only delayed my record attempt flight in El Centro by a few hours.

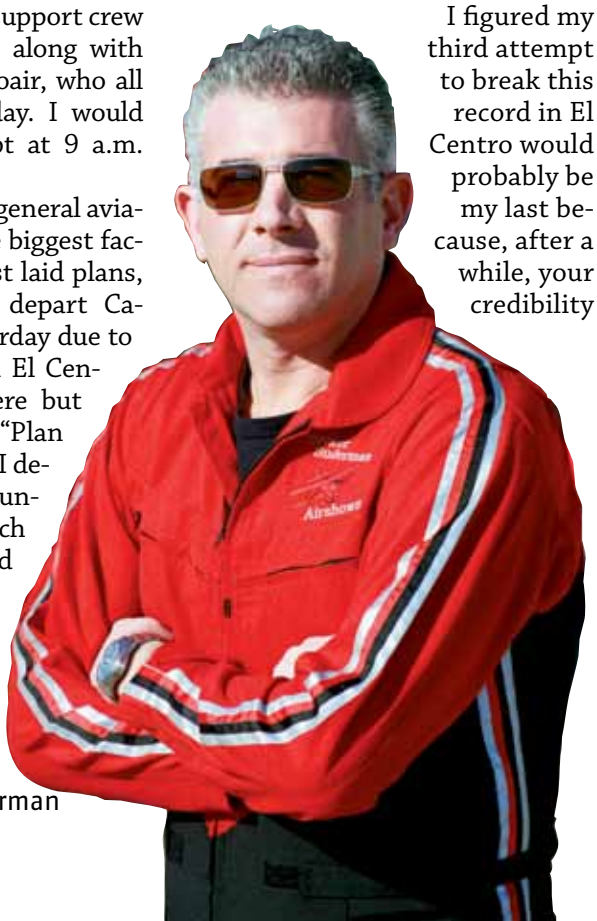
After landing and reviewing the video, only 77 turns were accomplished, and given that the record was 78, it was astonishing that I could have such a near miss. During the flight, I accidentally pulled the throttle partway off the wide open stop while making a mixture adjustment; I didn't notice the change in noise levels because my ears were clogged from the rapid pressure change. I spun for nearly 4,000 feet at half throttle, which cost me the record that day. Upon close study of the videos, there were other mistakes made as well, which were taken as lessons learned for the next attempt.

At this point, there was no doubt in my mind that the plane could break the record if the pilot doesn't prevent it from doing so.

With my tail between my legs and my ego crushed, I sheepishly went to the commanding officer and public affairs officer of the base and thanked them for their support. I then asked for one more chance right before the air show in March, which I was already confirmed to perform in. Without even blinking, they said yes, and I ended the year on an uptick.

The Last Chance

I figured my third attempt to break this record in El Centro would probably be my last because, after a while, your credibility



Spencer Suderman

wears pretty thin when you don't do what you say. I really felt like I owed them a world record for all they have done for me over the years. I spent the next several months making sure everything was dialed in: I practiced entering the maneuver with enhanced in-spin aileron to ensure all flight controls were engaged—especially at high altitude—and practiced crisp recoveries with an easy low-g pull. I spent more time riding my bike and doing squats to build leg strength to keep that right rudder all the way in for 3 minutes. I serviced the oxygen mask, tank, and regulator to make sure they were all in perfect working condition. I ran multiple tests on all three cameras, letting them record until the batteries ran out of juice, to ensure 3 hours of video could be captured—which is the expected length of a battery charge. The Garmin Foretrex 401 GPS, with barometric altimeter to record descent rates and get me right over my "spin" waypoint, was checked on every practice flight. If any piece of equipment that was needed to fly safely or document the event wasn't up to the task, it was going to be replaced.

For this flight, El Centro had reserved restricted area R2510A, which only goes up to 15,000 feet for air show week. I had to coordinate ahead of time with Los Angeles Center for clearance into the Class A above that. Working with LA Center was the easiest part of this process, since I already knew the ins and outs of taking a VFR airplane into Class A airspace and all of the same people were there from my last attempt.

I arrived in El Centro on Wednesday, March 12, 2013. I prepared the plane for a 9 a.m. departure on Thursday morning. When the sun rose, so did multiple cloud layers over the area. I delayed my takeoff for nearly 2 hours while waiting for it to clear. As every GA pilot knows, there is nothing more frustrating than waiting for weather to clear for a flight that you have to make. It was worth the wait, because anything that could obscure the vision of the cameras and cast doubt on what needed to be documented would have ruined the day.

I welcome all challengers to my record and give this advice: You will need to find a way to climb higher and spin faster. Keep in mind that the plane rotates at a constant rate but falls quicker in the higher altitudes due to the thinner air; my average number of spins per 1,000 feet was 3.93, and the plane achieves 5.6 turns per 1,000 feet in the last few thousand feet before the recovery. Here is the data on vertical speed from this flight.

Descent rates:
21,000 feet, 8,900 feet per minute
16,000 feet, 8,100 feet per minute
11,000 feet, 6,800 feet per minute
6,000 feet, 5,600 feet per minute.
Good luck!

In a reciprocating engine, top dead center of Piston Number 1 is the datum point from which ignition system measurements are made and the firing order is determined. For example, ignition timing is normally specified as degrees before top dead center (BTDC). *IAC*

Giles G202

Critical canopy latch modification for Giles 200 and 202 aircraft

BY RICHARD HOOD AND ANDREW WRIGHT

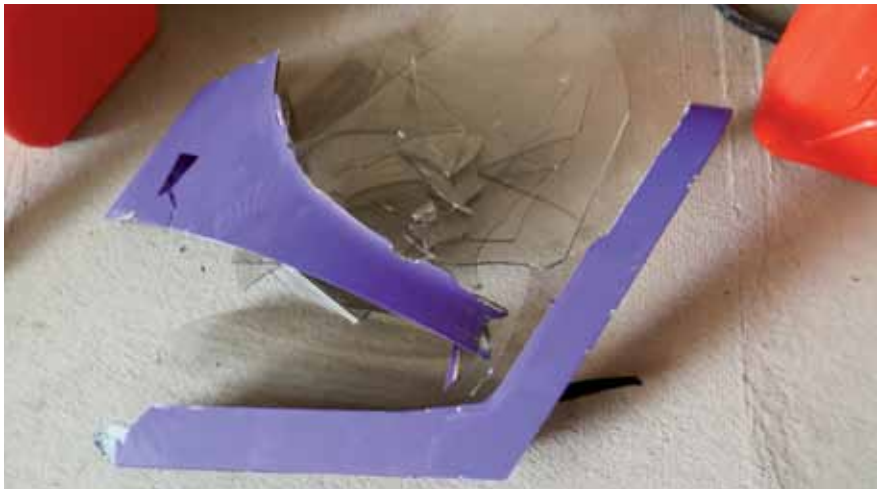
Canopy Departure

BY RICHARD HOOD

A few weeks ago, we lost the canopy off our Giles G202 in flight.

There have been a lot of requests from Giles owners as to the circumstances of the departure, and I wrote this article to disseminate the information more widely.

We are lucky enough to have an aerobatic practice box located next to a private airfield surrounded by cornfields and dairy farms. One of our pilots was practicing the Intermediate sequence for the upcoming national competitions with fellow pilots critiquing him from the ground. He had just completed a loop and was at about 170 knots (had just been up to 200!) when he noticed a bit of daylight from the front left side of the canopy, immediately followed by the departure of the canopy (with an associated loud bang).



Aircraft control was normal, and he initially considered flying the aircraft back to home base, about five minutes away, but wisely decided to land, mainly based on the fact that whilst he suspected damage he could not turn his head to look, as he feared his sunglasses would be ripped off in the slipstream, leading to the full wind blast in his eyes.

The pilot was wearing a cap (normally he would wear a helmet) and received a graze on his forehead, and as he has a pretty thick skull, no damage has been done. It could have been worse as there were holes just above where his head would have been where something sharp had pierced the carbon fiber!

The team managed to find some of the parts (after a four-hour search through a mature cornfield) but unfortunately not the latching mechanism (despite subsequent searches). So we don't conclusively know what caused the departure, but I can tell you that the latch had a circlip fitted to the latch shaft. I have now learned that this should have been drilled and split pinned!

I'll let the photos do the talking.

Critical Canopy Latch Modifications for Giles 200 & 202 Aircraft

BY ANDREW WRIGHT

www.CarbonFiberAirshows.com

I fly a G202 in Advanced and Unlimited level competition and surface level air shows. For many years, I have wondered about Marta Meyer's fatal accident, where her G300 canopy departed. Recently a G202 in New Zealand also lost a canopy. Richard Hood commented on the aerobatics mailing list that, while they could not pinpoint the cause, the latch had circlips that should have been drilled and split pinned (cotter pinned). When I looked carefully at my canopy latch, I decided this had to be fixed immediately. Losing my canopy anytime, but especially while inverted 100 feet off the deck, just doesn't bear contemplation.

As Photo 1 shows, the latch has a grooved center pin retained by a snap ring. Two smaller pins welded to the lever connect to rods that drive locking pins located at the fore and aft ends of the canopy. These smaller pins are also grooved, and the rods retained by small circlips. Were one of these circlips to come off, the entire rod and canopy locking pin could easily fall into the cockpit, leaving one end of the canopy unsecured.

Fortunately, the fix as suggested by Richard Hood was fairly easy. I disassembled the latch and drilled 1/16 inch holes through the center pin and the two smaller pins. I located these holes just above the grooves, in order to keep the circlips and snap rings, but backed them up with cotter pins. Photo 2 shows the reassembled latch.

I urge all G202 and G200 owners to check their canopy latches, and strongly consider backing up any circlip or snap rings with cotter pins. *IAC*

2013 Accident Recap

Keeping it safe in 2014

by Steve Johnson
IAC Safety Chair

The 2014 flying season is nearly upon us, or has already started if you live in the southern United States. Are you ready? Has your annual inspection been completed, any squawks corrected? After the airplane, is your mind ready? Has your practice routine been developed for the new sequences? Hopefully, the answers to all these questions is yes, or will be shortly.

While airplane maintenance is relatively straightforward, "mind maintenance" is not. Our mental preparation is vitally important in starting a new aerobatic season. New sequences should start higher than normal so we can learn the hidden "gotchas" that can be found in most sequences. Will the new Known lose more altitude than expected? Is the spin one you haven't flown before or flown recently? Get these figured out with some extra altitude at the start. Our home aerobatic boxes, especially when not marked well or at all, tend to grow over the winter. Don't get in a big hurry when learning new sequences; take the "outs" until you are comfortable with the sequence, then bring it down to contest altitude and tighten it up to stay in the box, using small steps, to prevent any new "gotchas." The International Aerobatic Club website has some safety tools to help pilots who are considering moving up to a new category, as well as a checklist for contest site preparation and pilot skill and mental preparation. Use these tools to prepare yourself for the season. The tools are found here: *https://www.iac.org/safety-resources*.

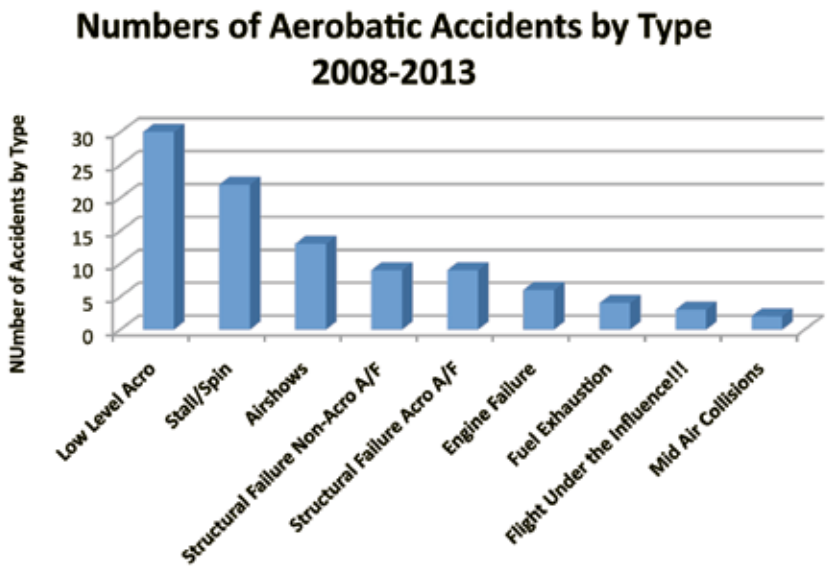
Contest directors, there are safety tools on the same webpage to develop your contest's incident response plan (IRP) and the acro risk assessment (ARA). The IRP is a required document at contests and is a part of the contest director's packet. Please complete this document properly and accurately, ahead of contest time. If you don't use the IRP during your contest, it means your contest went well. Having the IRP done—and disseminated to your contest staff—makes things go much better if an incident does occur.

The ARA can be used to identify hazards, both physical and weather related, at a contest site, as well as to identify increased risks with new aerobatic pilots and pilots moving up in category. In 2013, the IAC Regional Safety Coach program was started. The regional safety coaches are members of the IAC Safety Committee and can provide additional safety resources, ideas, and assistance to contest directors and contest staff. The Regional Safety Coaches are identified in the IAC Yellow Pages: *https://www.iac.org/yellow-pages*. There is also the aerobatic skills assessment, prepared by IAC Safety Coach Wes Liu, that pilots can use to determine what skills they need to move up to the next category. This self-assessment tool can be of great value in deciding if you have the aerobatic skills for the next level in competition.

Know and understand how your aircraft spins. The number two source of accidents in the last 6 years of aerobatic accidents is stalls/spins; see the chart on the next page. New Sportsman and Intermediate pilots may see a 1-1/4 turn spin. While straightforward, these spins do have an interesting technique necessary to stop them well for the judges. Be sure you understand the technique needed for these types of spins. For newer pilots, figures with rolls on up lines can create some interesting slips or skids that can cause the airplane to behave in an unexpected manner at the top with low airspeeds and high power settings. Again, practice newer figures at altitude before you fly at lower contest heights. Make very sure you can recover from botched spins and unexpected spins. After a spin has started is not the time to learn the recovery techniques needed for your airplane.

An NTSB search of aerobatic accidents reveals several trends that need to be discussed. In the recent 6-year period from January 1, 2008, through December 31, 2013, there were 96 total incidents, with 75 of those being fatal accidents and causing 106 fatalities. I have mentioned this before, but as aerobatic pilots, we need to exercise much greater than normal judgment, especially when carrying passengers. In the chart on the next page, one of the accident types is flying under the influence. Really?

The greatest numbers of aerobatic accidents were caused by trying to fly low-level aerobatics. Our great air show performers make such flight look much easier than it truly is, and unfortunately, a few people have to learn this the hard way each year. As stated before, stalls and spins are the second greatest accident source. Several of the stall/spin accidents were in non-aerobatic aircraft—8 of 22 total stall/spin accidents, mean-



ing there were 14 stall/spin accidents in aerobatic type aircraft. Of course, this doesn't mean that the pilot was airworthy and safe for aerobatics. Structural failures are relatively high on the list, and non-aerobatic aircraft had several accidents where the wings were pulled off the airplane by the pilot applying too many g's for the airframes. There were some aerobatic aircraft structural failures as well, which proves we need to be very careful during our annual/condition inspections and preflight inspections. There were 18 total structural failure accidents in this time period, with 9 each in aerobatic and non-aerobatic aircraft. There were 11 fatalities in these 9 non-aerobatic airframe accidents, while there were 5 fatalities in the aerobatic airframe structural failure accidents. Reading between the lines of the NTSB reports for the non-aerobatic structural failures indicates that "showing off" for passengers in the airplane or for spectators on the ground was the real reason behind the structural failures. Showing off for nonpilots is still great even when keeping within the limits required by normal category airplanes. We don't need to exceed the normal limits to make flight look wonderful. Watch this Bob Hoover video on YouTube for proof of that: *http://www.youtube.com/watch?v=uhkmY3rELeY*.

This is a bunch of raw data, but it means pilots are still killing themselves and their friends by performing low-level aerobatics and hitting the ground, and by stalls and spins from which the pilot cannot recover before hitting the ground. Please, please practice at altitude, especially early in the season, or if you are learning new figures and sequences as discussed above. And always take extra care when flying with friends and family. The psychological factors of flying with others make us want to take extra chances, to show off a little. Remember that showing off, just a little, still has very severe consequences for getting it wrong. An aerobatic flight instructor and a coach on the ground can provide a lot of learning in a fairly short period of time. It will always be worth the cost and effort with a good instructor.

Get your airplane ready for the 2014 season, and get yourself ready for the 2014 season. It does take both parts, airplane and pilot, to fly a great sequence. Use a good mechanic, even for just another set of eyeballs, on your airplane, and use the risk assessment tools described earlier as your personal checklists to be ready, mentally, to go flying. Have fun, and I will see you at the contests! IAC

BETH STANTON
COLUMNS / **BRILLIANCE AND BUFFOONERY**

Build It and They Will Come

Part I Deck: Let the games begin

How It Began

I've been a pilot for less than three years and involved in aerobatics less than two years. Stalls and the thought of spins scared me, so I sought out unusual attitude training. My life took a wild swerve when I found myself in Wayne Handley's Extra 300 three weeks after getting my private pilot certificate. Little did I know what I had originally feared was the most fun I would ever have in my life.

After returning to Pine Mountain Lake, CA to fly with Wayne three months in a row, he said, "Stop spending all your money with me and go do something responsible. Go get your instrument rating or something."

So I promptly joined the International Aerobatic Club. I figured if I loved aerobatics I should go hang around with the people who are doing it. Chapter 38, in Northern California, introduced me to the world of competition aerobatics. Dave Watson, one of IAC 38's tireless mentors, has coached me now for two years. With his invaluable support, I am getting ready to enter my third season flying the Pitts in Intermediate.

IAC 38 meeting group.

EVAN PEERS/AIRSPACE MEDIA PHOTOS

Beth presenting chapter goals.

"You Should Be Our New President!"

Martin Price, Dave, and I were having lunch at Livermore airport last summer. The arm twisting had begun. Martin, then our president, volunteered to stage his own coup.

Nope. My exact words were: "I loathe dealing with 'administrivia" and fractious people.'

Any organization, even one as fun as the IAC, has its share of these things. I imagined sitting around a boardroom table saying, "Yay," "Nay," and "I second that motion." This type of scenario makes me itchy and brings out a childish side that longs to behave badly. Aerobatic pilots are a bunch of Type A overachievers with strong opinions. (See?) I'd been around this rodeo a couple of years now and had witnessed the action. Why on earth would I subject myself to this on purpose?

There were millions of things I did not know: forms, reports, insurance, waivers, rules, and regulations. I could certainly figure this stuff out, but these are definitely not my favorite things. I shuddered.

"We will not leave a flaming bag on your doorstep," promised Martin. "We'll help. We've been doing it for years; it's no big deal."

I was still suspicious.

In a past life, I worked in hotel management. I once was promoted to front desk manager with zero front desk experience. "I'm not worried about it," the general manager told me. "I want you out in front. You'll figure it out as you go."

I'm good at project management, creative ideas, community-building, and personal relations. Oh, and fun. I am really good at fun. As long as I had help and guidance, I figured I could do this. I decided to take the President Plunge.

People are attracted to fun and excitement. They are repelled by crabby and boring. I decided to leverage the former.

Start With the Fun

"It had long since come to my attention that people of accomplishment rarely sat back and let things happen to them. They went out and happened to things."

–Leonardo da Vinci

Running my own business for 20 years has taught me that people come to you because they have a problem to be solved or a need to be met that you can help with. The formula is simple: Establish a relationship, communicate, action, repeat. I figured this would apply equally as well for running an IAC chapter.

My coronation was at our chapter meeting in November. I knew that with the hectic holiday season upon us, it would be difficult to rally the troops for a December meeting. I did not want to lose momentum. In lieu of a meeting, I figured a holiday party would be a more informal excuse to gather. A bunch of us met at iFly San Francisco for some indoor skydiving action, then had dinner afterwards. Eat, drink, and be merry. Game on.

The sleeping giant began to awaken. Inquiries started coming in about upcoming events and meeting dates. My first priority was to reach out to current, lapsed, and potential new members. Email marketing and social media have been useful tools for my business, so I thought I'd start there. I started to send out emails. IAC 38 has a Facebook page with over 200 members. I started posting there regularly, working to create a buzz with what we were up to, complete with incriminating photographic evidence.

I had Cunning Plans for 2014 and wanted to share them with as many people as possible:

- monthly meetings hosting an awesome speaker
- 100 percent increase in membership
- newsletter
- judge school
- critique days
- field trips
- contest.

Simple.

Kick It Off Big

My goal was to knock it out of the park with the January meeting. We needed a rock-star guest speaker to ignite the fire. Of course, Wayne Handley came first to mind. He cheerfully agreed when I asked.

Rich Perkins at Attitude Aviation, KLVK, has been hosting IAC 38's meetings for years. It's a great space and he provides pizza and soda. Historically, we held meetings in the classroom. It could get crowded in there, approaching 20 people. I had a sneaking suspicion we would need more space. I wasn't sure exactly how many would show up. Secretly, I hoped for 25; dare I dream for 30? We decided to move the meeting into the hangar just in case. The added


Beth with the Believe Wreath.

EVAN PEERS/AIRSPACE MEDIA PHOTOS


Wayne Handley

bonus was all the marvelous airplanes that made for fetching ambiance. We set up 30 chairs and people began to trickle in. I was introduced to award-winning photographer Evan Peers of Air Space Media who was at Livermore doing some aerial work. He asked if he could take pictures of our meeting. Umm, yes! I wanted photos for our Facebook page and upcoming newsletter. This was perfect.

Just at 3 pm, when we were about to begin, a flurry of planes and people descended upon the hangar. We scrambled to marshal airplanes and find more chairs. They had come! Forty people turned up to hear Wayne speak. I made an introductory presentation outlining my Cunning 2014 Plans and then turned it over to Wayne. He gave an engaging talk, focusing on safety and precision flying, sharing wisdom he has accrued over the years. He was then asked to elaborate upon some of the stories that make up his legendary career. We


Wayne Handley and the IAC 38 board.

could have listened for hours, each of us recognizing how special this moment in time truly was.

As Wayne waved goodbye from the window of his Bonanza while he and Karen taxied out, a wave of gratitude rushed over me. So many people had rallied to make this meeting a success. I was humbled by how many eager IAC 38ers stepped up to offer their help and talent.

We were off to a great start.

100 Percent Increase in Membership

"The greater danger for most of us lies not in setting our aim too high and falling short; but in setting our aim too low, and achieving our mark."

– Michelangelo

To promote membership, I had set out a table with IAC literature and IAC 38 join/renew forms for the meeting. There was also a sign-up sheet for a guest e-mail list to keep in touch with any new people. Happily, we signed up six new members and got a dozen e-mail addresses.

After the meeting, one of my Chapter 38 colleagues commented that we had very different styles. With a twinkle in his eye, he stated that his approach to building membership would have been more incremental. He thought I had set a very high bar. Instantly, I felt a pang of doubt. "Dammit!" I thought, "Did I just set myself up for failure? What have I done?"

However, as I drove home, it began to slowly dawn on me . . . it had not even occurred to me that a 100 percent membership increase was an unrealistic goal. Privately, I had concluded that doubling membership would be easy. If we had 30-something members and everyone brings in one new member…done. I actually had thought we could get closer to 100 members but had kept that to myself, erring on the side of caution. Now you all know.

What happened the following month was unbelievable, except for the fact that I believed it. I could not have envisioned the end result at the onset. It sort of just evolved as it unfolded. In awe, I watched the pieces fall perfectly into place. I'll tell you about it next time.

Check out IAC38.org for recent newsletters and more glorious details.

Beth can be reached at *bethestanton@gmail.com*. IAC

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Inspection and Assembly

For many years, my customers have asked me what their new parachute looks like; do I assemble it, or does it come ready to use? In my case, I prefer to do the final inspection and assembly. Even though the factories do a fantastic job, I personally feel a different set of eyes, other than the factory, should do the final assembly.

Whether your parachute comes in a plastic bag or a box or is handed to me, the procedure for inspection and assembly to place it in service should be the same, no matter who does it. Someone has to take all the parts and put them together. That person is usually a certificated parachute rigger or a factory representative. What I've decided to do in this column is give you an idea of how this is done. For this pictorial demonstration, I will be using a 24-foot Preserve 1C canopy manufactured by Free Flight Ent., located in Lake Elsinore, California, and putting it into a Mini Softie back-style harness/container manufactured by Para-Phernalia Inc., located just north of Seattle in Arlington, Washington.

A quick note before I proceed. I follow the procedures I'm about to show you on any parachute I have never seen before that comes into my shop. It may already be assembled and just needs a repack and recertification, but has it been done correctly? When a parachute leaves my shop, it will have my seal of approval on it. The packing data card that accompanies your parachute will also bear my signature attesting to its airworthiness. Don't lose this card—it's the maintenance log for your parachute. In the United States, each certificated rigger has a seal press with a unique symbol. When they seal your parachute, it's embossed onto the lead seal that goes around the bottom rip-cord pin. Mine is JQI. Other countries may vary a bit, but the person who serviced your parachute will be clearly identified. Each certificated rigger (in the United States) must keep a master logbook of the work he has accomplished for a period of at least two years. In the Air Force, where I was a survival equipment technician, our motto was "I'll always be sure." Those are words you and I can live by.

Now let's begin. Photo 1: "Some Assembly Required." I can usually inspect, assemble, and pack a new parachute in about an hour, but this is not a speed contest. Whether it takes one hour or all day is not important. It has to be done correctly. Photo 2: This shows the canopy out of the bag with the pilot chute

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

next to the suspension lines. I'm preparing to place the rubber bands on the deployment diaper. If you would like more information about deployment diapers, go to my website and click on my "Ask Allen" January 2011 column. Photo 3: I'm ready to attach the lines to the risers of the harness/container, but first I must make sure the lines are in their proper order. When I'm done, a complete line check will have been accomplished to ensure the lines are attached to the risers with no twists and in their proper order. Photo 4: This shows one set of suspension lines attached to the riser and the gold-colored steering handle threaded through but not attached or tensioned to the steering line. Some parachutes, such as Strong, have red handles. The color may vary and some parachutes have no steering handles. You need to find out what you have and how to identify them. Photos 5 and 6: These show me inspecting the canopy. I will inspect every seam and line attachment for any errors. Most parachutes have hundreds of thousands of stitches. Note the white area in Photo 5 shows one of the three mesh steering vents in this parachute. Two of the vents on this parachute are opened and closed by the gold-colored steering lines attached to the steering handles, making for a maneuverable parachute with

Photo 10

Photo 11

Photo 12

Photo 13

Photo 14

Photo 15

about a 5-mph forward speed. To understand more about steering your parachute, I suggest reading some of the many articles on my website. Photo 7: The canopy inspection has been completed and the steering lines attached. I now run another complete line check. Finally I'm ready to pack this parachute.

Now let's pack this parachute. Photo 8: The canopy has been flaked out (straightened) and the skirt folded at 45 degrees to the main air channel. Photo 9: I've completed folding the canopy in fifths. Photo 10: The deployment diaper is partially locked/closed. Photo 11: The deployment diaper has been locked shut with three stows of lines in rubber bands. The lines on most parachutes are held in place with rubber bands. Photo 12: The remainder of the lines has been stowed on the deployment diaper. Photo 13: The canopy is being placed into the container. Photo 14: The canopy has been placed into the container according to the manufacturer's specifications and is now ready to close. The (silver and white) spring-loaded pilot chute is lying next to the parachute container. It has a 28-inch-tall spring that I will compress to about 1 to 2 inches as I complete the final steps in closing the parachute container. This particular pilot chute will require approximately 50 pounds of force to compress. Remember, if you practice pulling your rip cord at home before having your parachute serviced, be careful. I don't recommend doing this next to your Ming Dynasty vase. The pilot chute will fly out several feet. Photo 15: The pilot chute has been compressed on the top and bottom closing flaps. I'm almost done and only the two side flaps remain to be closed. Photo 16: The remaining two flaps have been closed, and the bottom ripcord pin has been properly sealed as required by the FAA. And most importantly, all my tools have been accounted for. Last but not least, the paperwork. I will enter what work I accomplished on your packing data card and sign it. As I stated earlier, each parachute must have a packing data card; this is the maintenance record for your parachute. I also will enter the same information into my master logbook. Now you have an idea of how your parachute rigger assembles and packs your expensive cushion.

Photo 16

Most countries require a master rigger to assemble or make major changes to a parachute. In this country, a senior rigger may do this, but only under direct supervision of a master rigger or factory representative. If you have further questions, please call or e-mail (find my information at the website listed at the top of the page).

Fly safe and blue skies. *IAC*

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