

# SPORT *Aerobatics*

JUNE 2018

OFFICIAL MAGAZINE of the INTERNATIONAL AEROBATIC CLUB

- FLYING THE 2018 SPORTSMAN
- IAC ELECTIONS



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### COVER

Eager to fly,  
Mike Heuer brings  
the first Super Acro  
Sport to life in 1974.

Photo by Verne Jobst

## PLAN TO ATTEND THE IAC'S AIRVENTURE FORUMS

**PREPARATIONS FOR THE IAC'S** exhibition, 25th One Design and 45th Acro Sport Anniversaries, during EAA AirVenture will include a full roster of forums at the IAC's Vicki Cruse Educational Pavilion. The forums are scheduled daily from Tuesday, July 24, through Friday, July 29, 2018.

Our special guest, Dan Rihn, will give a forum on Wednesday morning titled "The One Design DR-107?" Dan Rihn will talk about events leading up to and designing a new aircraft to create a new class for the IAC. From this concept the One Design was born, an aircraft that the pilot could build at a relatively low cost and go on to fly competition aerobatics. **IAC**

### TUESDAY, JULY 24

- |                       |   |
|-----------------------|---|
| 8:30-9:45 a.m.        | <i>Emergency Bailout Procedures &amp; Survival Equipment for Pilots</i> with Allen Silver |
| 10-11:15 a.m.         | <i>Spins and Recoveries from "Out of Control" Situations</i> with Bill Finagin            |
| 11:30 a.m.-12:45 p.m. | <i>Basic Elements of Aerobatics</i> with Dagmar Kress                                     |

### WEDNESDAY, JULY 25

- |                    |  |
|--------------------|--|
| 8:30-9:45 a.m.     | <i>17 Years of Extras</i> with Jeff Granger                      |
| 10-11:30 a.m.      | <i>The One Design DR-107</i> with Dan Rihn                       |
| 11:30am-12:45 p.m. | <i>Slow flight, Stalls, the FAA, and You</i> with Michael Church |

### THURSDAY, JULY 26

- |                    |   |
|--------------------|---|
| 8:30-9:45 a.m.     | <i>Vintage Homebuilt Biplanes: Aerobatics on the Cheap or Financial Black Hole?</i> with Budd Davison |
| 10-11:30 a.m.      | <i>Acro FS: The New Flight Sim that does Aerobatics</i> with Jim Bourke                               |
| 11:30am-12:45 p.m. | <i>Ready Pilot 1 - Leveling Up with Aerobatics</i> with Michael Lents                                 |
| 1-2:15 p.m.        | <i>Having Fun with Recreational Aerobatics</i> with Gordon Penner                                     |

### FRIDAY, JULY 27

- |                       |   |
|-----------------------|---|
| 8:30-9:45 a.m.        | <i>Annual IAC Membership Meeting</i>  |
| 10-11:15 a.m.         | <i>Get Ready for the World! - USA Advanced Aerobic Team</i> with Aaron McCartan               |
| 11:30 a.m.-12:45 p.m. | <i>Freestyle Aerobatics</i> with Jim Bourke   |
| 1-2:15 p.m.           | <i>Meet the Yak 52: Primary Aerobatics to the Worlds</i> with Marion Harris and Ross Ferguson |

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# The Evolution

BY ROBERT ARMSTRONG, IAC 6712, IAC PRESIDENT

**TIME IS PASSING WAY TOO FAST FOR ME.** It seems like only last week that I was greeting members at EAA AirVenture Oshkosh 2017, yet plans are well underway for the 2018 event. The IAC will showcase two important planes that are a part of who we are. Both are from the days of simpler times: no transponders, no lights, and way before anyone thought of ADS-B. The EAA Biplane evolved into the Acro Sport and was made available to the enthusiasts and builders who could then construct their dream aircraft from a set of plans. There were no high-speed kits and very few pre-made items to buy. This was the era of real builders.

The IAC was an evolution in itself. It started as a group of like-minded pilots who saw a future in promoting the safe flying of aerobatics with a means to increase the safety and

acceptance of all aerobatic flying. The beginnings of the IAC were at kitchen tables and in airplane hangars, and the early rules were simple and not overwhelming. Years passed and now we have executive office space, and some have indicated to me that the rules have overwhelmed them to the point that they do not find enjoyment in the organization any more.

I, too, look back to the fun, good old days that some tell me they miss. I was part of the board that passed new rules, which I did not support but the majority of the board did. Now, I reflect on

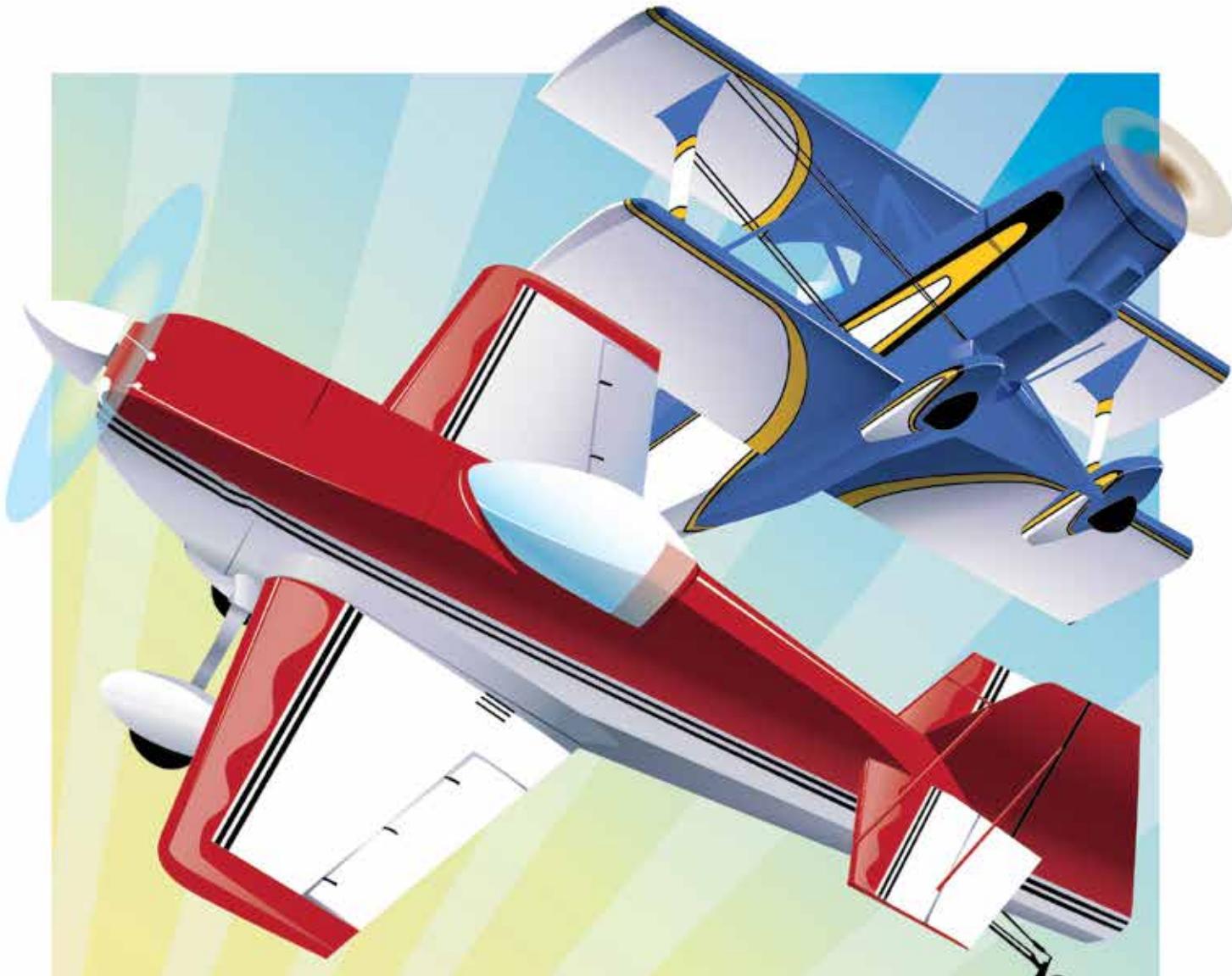
some of these changes and can see how we are our own worst enemy. The telling sign of a problem is when the rule imposed one year is being revised or removed two years later. This shows that we were not thinking of the future when some of this was done. We have some rules that were intended to favor or restrict one party, and rules that are intended to make something easier for

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a volunteer. We have allowed the complexity of the Known program to escalate; yes, category creep is real. The practice of changing the Known because some are not finding a category challenging enough has been

a disaster. Case in point, when a Sportsman pilot, who has been flying and winning for years, must back down to Primary because his plane cannot fly the Known, we have gone too far. I have listened to many encourage the addition of figures to all categories. I then sit and think, a round loop is still a challenge to any new pilot. So why do some think that pilots starting in 2018 are better than pilots who started in 1978?

**CONTINUED ON PAGE 5**



ONE DESIGN DR-107  
ACRO SPORT  
IAC PAVILION AT AIRVENTURE  
JULY 23-29, 2018



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POSTER CREATED BY AZIZA ENGLISH 2018

## PRESIDENT'S PAGE

### CONTINUED FROM PAGE 3

The progression of the categories has a very rocky history. When the Unlimited and later Advanced programs were adopted from CIVA, it produced an increase in the progression of difficulty that some felt needed closing. This has been relieved somewhat by IAC changing the policy of paralleling CIVA. The real issue of the creep is how IAC adopted the Free programs for each year. In the "old days" the next year's programs were designed and selected at the public members meeting at the Fond du Lac contest and convention. As you may imagine this could be rather colorful. That system of selection has now migrated to what is used today, and this is working well — except for the difficulty of some programs. I agree, the IAC has guidelines for baseline planes in Sportsman and Intermediate, but not beyond. I feel that we need to address our members first and look for sequences that our members can fly without a half-million-dollar plane in both Advanced and Unlimited. I can hear the call: This does not prepare our pilots for the world contest. This is not an incorrect statement, but are we out to train 10 pilots, or have 100 fly in the regional contest and have fun?

### OUR RULES HAVE EVOLVED OVER THE YEARS AND NOW NEED A REALITY CHECK IF WE WISH TO REMAIN IN EXISTENCE.

And then the rules. We have created rules that burden pilots, judges, and contest organizers. Some were unintentional and others just ill conceived. One of the most irritating to me is when we converted from an aerobatic contest to a wing-wagging contest. When does the contest flight begin? With the first maneuver? No it begins with the moment the pilot wags the wings, but no, there may be a penalty for that if someone feels that it was only 30 degrees on the first wing dip. This is not new; it was an issue that first appeared in 1983! It was mandatory until around halfway into the contest year, then removed and made optional again, and then again made mandatory, which is the rule in place today. This is only one example of many such issues that need to be rectified.

No sport can exist without some guidelines or rules. Our rules have evolved over the years and now need a reality check if we wish to remain in existence. Some points to ponder: Should we increase the number of figures in the Advanced and Unlimited Free program? Should we add the use of radio to signal the start and end of a sequence, as well as any interruption? This will allow the elimination of the wag penalties. Perhaps a change to the program of qualifying and certifying judges is needed.

How do you perceive the evolution of our club and our sport? **IAC**

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

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## ► TOP STORY



Sportsman pilots in Fond du Lac, Wisconsin, in 1970.  
Giles Henderson is shown kneeling third from right.

## New Giles Henderson Trophy for Sportsman National Champion

ON MAY 3, 2018, the International Aerobatic Club board of directors created the new Giles Henderson Trophy to be presented at the U.S. National Aerobatic Championships each year. The trophy will be awarded to the new U.S. Sportsman Aerobic Champion. Giles lost his life in a skydiving accident in December 2017 and had most recently competed at the U.S. National Aerobatic Championships in Oshkosh in September.

IAC has launched a fundraising campaign to make the new trophy. Giles was the quintessential grassroots pilot, and if you are a supporter of grassroots aerobatics, there could be no finer way to show your support than by donating to this fund in memory of one of IAC's greatest Sportsman pilots.

In memory of Giles, a veteran member and aerobatic competition pilot, we urge your support. Full details can be found at [www.IAC.org](http://www.IAC.org).



## SCHOLARSHIP APPLICATION DEADLINE — JUNE 30, 2018

THE DEADLINE FOR APPLICATIONS to the 2018 IAC scholarships is June 30. Visit [www.IAC.org/scholarships](http://www.IAC.org/scholarships) for more information and to apply.

The CP Aviation Vicki Cruse Memorial Scholarship aims to promote aviation safety through unusual attitude and aerobatic training.

The Greg Koontz Airshows Aerobatic Instructor Scholarship in Memory of Bobby Younkin is intended for certificated flight instructors who have some tangible experience in aerobatics and have demonstrated through their actions that they are interested in becoming involved in aerobatic instruction.

The Douglas Yost Memorial Aerobatic Scholarship Grant promotes aviation safety through aerobatic training through an endowment established by the Yost family in 2002.



## AIRVENTURE NOTAM RELEASED

THE EAA AIRVENTURE OSHKOSH 2018 notice to airmen (NOTAM) is now available for download and is mandatory reading for pilots planning to fly to the convention. The NOTAM is in effect from 6 a.m. on July 20 until noon on July 30. Download the NOTAM at [www.EAA.org/notam](http://www.EAA.org/notam).

If you are planning to park in the aerobatics area, please have your IAC arrival sign ready.

The NOTAM specifies sign codes used to tell ground personnel your destination on Wittman Regional Airport. You need one of these signs for your arrival and another for departure. Signs can be made with dark marker on a light background and should be clearly readable from a 50-foot distance. If you prefer, these signs can be printed on your computer using one of the files available at [www.EAA.org](http://www.EAA.org).



## WAC FINAL FREESTYLE STRÖSSENREUTHER TROPHY FUND ESTABLISHED

### AFTER THE DEATH of Manfred

Strössenreuther in 1986, the Aero Club of South Africa donated the Manfred Strössenreuther "Freedom of Flight" Trophy to the German Aero Club at the 1986 World Aerobatic Championships and became a floating CIVA/FAI trophy. It was first awarded to the winner of the Final Freestyle program, Petr Jirmus of Czechoslovakia, at the 1986 WAC.

Sadly, the trophy was lost after presentation to U.S. pilot Zach Heffley at the 2007 World Championships. Despite wide-ranging searches no trace of it has ever been found. Donations are now

sought to commission a replacement for this prestigious trophy, which will be awarded to future FAI World Champions in the Final Freestyle program. The fund-raising target is €15,000 (US\$18,000) and it will remain open until November 2018.

IAC fully supports this effort to fund a replacement for the prestigious Strössenreuther Trophy. IAC's own Rob Holland has been the winner for an unprecedented four consecutive times, and we would like to see this trophy on Rob's mantel again. Please support the fund at [www.Leetchi.com/c/stroessenreuther-trophy-fund](http://www.Leetchi.com/c/stroessenreuther-trophy-fund).

### FINAL FREESTYLE WORLD AEROBATIC CHAMPIONS

- 1986 Petr Jirmus, Czechoslovakia
- 1988 Patrick Paris, France
- 1990 Jurgis Kairis, USSR
- 1994 Jurgis Kairis, Lithuania
- 1996 Patrick Paris, France
- 1998 Roland Dominique, France
- 2000 Peter Besenyei, Hungary
- 2001 Klaus Schrodt, Germany
- 2005 Klaus Schrodt, Germany
- 2007 Zachery Heffley, United States
- 2009 Renaud Ecale, France
- 2011 Rob Holland, United States
- 2013 Rob Holland, United States
- 2015 Rob Holland, United States
- 2017 Rob Holland, United States

## CALL FOR RULES PROPOSALS

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

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

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



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# IAC Notice of Election

And candidate profiles

**VOTING ENDS MONDAY, JULY 23, 2018**

**THE INTERNATIONAL AEROBATIC CLUB** board of directors invites members to vote in the 2018 election for club officers and directors. Balloting closes on Monday, July 23, at 6 p.m. CDT. Ballots must be received before closing to be counted.

## ► CANDIDATE PROFILES

### **ROBERT ARMSTRONG FOR PRESIDENT**



I am a longtime IAC member, competitor, and aerobatic airplane builder. I have previously served on the board for several terms and returned to the leadership role as elected vice president. Mike Heuer's resignation presented the opportunity to move to the president position by appointment of the board of directors,

and I am now running for a new term to be elected by the members of the IAC.

I did not assume the position of president without reservations; it is a volunteer position with many hours of work required each week. To help with this decision I contacted a number of members for their guidance and recommendations. I received a tremendous amount of

encouragement. With that I also asked for input on what they felt was missing in the IAC today.

The overwhelming response centered on the fact that many did not find the IAC to be fun anymore. So, we have a membership that is shrinking and that is not enjoying the experience in IAC with the value that attracted them in the past.

I would like to have the opportunity to be the spark plug that helps the membership grow again and make this a large family that all feel welcome in. The first time a person takes a plane ride is when impressions are made that last a lifetime, and I feel that it is very important to make the same impression when a person comes to the IAC with an interest in expanding into the world of aerobatics. As a pilot, enthusiast, or dreamer, all should find a welcome that will engage them for a long time.

I hope to make the IAC a fun place for many to enjoy.

### **LYNN BOWES FOR SECRETARY**



I earned my private pilot certificate in June of 1979, and since then 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 IAC 15 in Kansas City in 1985 and became

a regional judge in 1986 and a national judge shortly thereafter. In 1996, I moved to Lincoln, Nebraska, and joined the Midwest Aerobatic Club IAC 80. Altogether I have been chief judge, contest director, line judge, runner, volunteer coordinator, newsletter editor, chief cook, and corner judge – I always fall on the side of activity.

I was appointed as an IAC director in the spring of 2011 and was elected director at the following election in 2012. In 2014, I was elected to the secretary position and have never missed a board meeting, executive committee meeting, or a finance committee meeting since that time, and have done a good job staying connected and filing meeting minutes.

I was the chair of the collegiate program from 2012 through 2015 and enjoyed promoting that energetic, youth-focused program. I have been a regular contributor to *Sport Aerobatics*, supporting the Collegiate Program, and will continue to do so in support of our Collegiate Program.

In 2015, as chair of the Pavilion Renovation, I worked closely with Mike Heuer, Margo Chase, and Trish Deimer-Steineke as we made plans to redo the exterior and interior of the IAC Pavilion at Oshkosh. This required constant communication with these talented people to translate their visions into reality as the work party built displays and implemented designs.

I was registrar for the 27th World Aerobatic Contest held in Sherman, Texas, in 2013. This position required building a system for competitor entries from 17 countries, communicating clearly with foreign competitors who spoke little English, badging more than 500 volunteers, and establishing 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. I forged many new friendships during the year prior and during those two weeks in Texas.

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 a retired Advanced competitor – Ed Bowes – and we live in Lincoln, Nebraska, where we race go-karts and still play with hotrods and motorcycles.

#### MIKE HEUER FOR DIRECTOR



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.

My first contest was in 1968, eventually progressing through the categories from Primary (now Sportsman) 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 and then flew N442X in Advanced – the Pitts S-1S which is now displayed in the EAA Aviation Museum.

It has been my honor to serve the IAC as an officer, director, and volunteer for most of the organization's life. I have a wide range of experience in the sport, ranging from the grassroots level as a former chapter president, up to international competition, and am one of the founding members of IAC. My father, Bob Heuer, was the first IAC president.

I have previously served in nearly every leadership role in IAC – president, vice president, executive director, treasurer, and a member of the board of directors. I am also a former chapter president, contest director, national judge, chief judge, and editor of *Sport Aerobatics*. I have been a longtime contributor to *Sport Aerobatics* and *EAA Sport Aviation*, and have acted as IAC's historian since its foundation in 1970.

As a former member of the board of the NAA, former member of the executive board of the FAI in Switzerland, USA's delegate to CIVA, and an EAA director emeritus, I understand how these organizations work together to benefit sport aviation.

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

I also have experience in administration, finance, and nonprofit association management. Under my leadership, IAC adopted a new brand of the highest quality that extends to all we now do for the membership. IAC membership grew under my leadership, IAC's pavilion on the EAA AirVenture Oshkosh grounds was improved, and the organization has never been financially stronger – which makes it possible for IAC to offer its members the kinds of services and support they deserve.

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# LINES & ANGLES

If elected as a director, I will continue to focus on expanding and improving our *Sport Aerobatics* magazine, increasing communications with members and chapters, and continuing a top-to-bottom review of IAC's finances and programs to ensure we are doing our best to provide the best membership services.

Getting the right volunteers into the right positions is a huge challenge for leadership. As a board member, I will seek to bring new people into IAC

leadership positions to build for the future. In the meantime, I will serve as assistant contest director for the U.S. National Aerobatic Championships in Oshkosh in September 2018, and hope to make it the best Nationals ever under the leadership of our contest director.

I pledge that if elected director, members' phone calls, e-mails, and text messages will always be answered – quickly. I enjoy solving problems, helping members, and making membership in IAC enjoyable and worthwhile.

## ROB HOLLAND FOR DIRECTOR



I'm asking for your vote so I can continue to represent the membership of IAC as a director.

I have been a proud member of the IAC for 17 years and in that time have dedicated my life to the art and passion of aerobatics. I climbed the ranks from flying Sportsman to eventually earning a position on the U.S.

Aerobic Team. I'm a seven-time U.S. National Aerobatic Champion and I have been proud to represent my country at the World Aerobatic Championships many times. Through all of that I have never lost sight of what makes the sport of aerobatics and the IAC great – the people. If you're a new Primary pilot, an Unlimited competitor, or just someone who likes to watch aerobatics, I will represent you to the best of my abilities.

Blue Skies.

## DEBBY RIHN-HARVEY FOR DIRECTOR



It would be an honor to continue to be your representative on the board of directors and to be a voice for all members, especially the "grassroots" members.

We have made a great deal of progress in the IAC the past few years, but there is still work to accomplish. The board wants to make the IAC strong, profitable, and a fun place where we can share, educate, and pass on our passion for aerobatics. We have addressed many issues in the past two years and have many great ideas and plans for the future to make our membership proud.

I have been involved in aviation my entire life and am the third generation of aviators in my family. However, when I started flying aerobatics in 1978 my family thought I had lost my mind. I guess I have, because now it is my passion. I began competing in 1980 and on a regional level have held many offices within Chapter 25 (Houston). I have been the contest director for several regional contests, as well as working in all positions necessary during contests.

Nationally, I have been a judges school instructor and am currently an active national judge.

I have been involved with international aerobatics since first qualifying for the USA Unlimited Aerobatic Team in 1983. I had the honor of qualifying for 16 Unlimited teams and represented the United States in 15 world championships over a 31-year period. Internationally, I represent the United States as a delegate to CIVA.

My passion goes beyond just that of the IAC – it also includes teaching, coaching, mentoring, encouraging, and promoting aviation. I have owned and managed a fixed-base operation since 1979 with an emphasis on aerobatics and safety proficiency training. I am also an FAA designated examiner, an ICAS aerobatic competency evaluator, and an air show pilot.

If re-elected, I promise to continue to be 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. There is much work to be done, but together we can make this the best aerobatic club possible. Let's remember the "FUN" of aerobatics.

## RON SCHRECK FOR DIRECTOR



I like numbers. Numbers tell me something. For instance, IAC membership prior to the global recession was above 6,000, and today it hovers in the neighborhood of 4,200. Some say that the cost of IAC competition is the culprit, but the numbers don't support that conclusion. Only about 11 percent of IAC members are active competitors so the cost of competition is not a factor for 89 percent of the membership. I believe we must pay attention to the 89 percent, and I have joined the IAC membership committee to do just that.

Here's another number: There are more than 7,500 aerobatic RV aircraft, and RV pilots competed in only 28 events in 2017. The good news is, that is twice the level of RV participation from 2016! As an RV-8 competitor myself, I have taken the lead in promoting RV competition.

I keep reminding myself that avalanches are usually started by a single snowball. I'm throwing snowballs every chance I get!

And yet another number: I discovered that one in three first-time IAC competitors never return to fly another contest! This number shocked me, and when I reported this finding to the IAC leadership they were shocked as well. I hope to make that statistic a historical footnote. I have ensured that contest registrants can indicate if this is their first contest so contest directors can see that these pilots are mentored before, during, and after that first contest. We only get one chance to make that first impression so it has to be a priority.

You can see that we have a lot to do. These numbers tell a story, but people influence the numbers. Along with all of the IAC leadership, I am hard at work to make the numbers tell a great story. If I have earned your confidence, I hope you will allow me the privilege to continue to serve you as an IAC director. **IAC+**

# AERO

APR 05 Snowbird Classic • Chapter 89 • X35: Marion County Airport, Dunnellon, FL  
APR 13 Hammerhead Roundup • Chapter 36 • L08: Borrego Valley Airport, Borrego Springs, CA  
APR 27 Carolina Boogie • Chapter 19 • W03: Wilson Industrial Air Center Airport, Wilson, NC  
APR 27 Early Bird 2018 • Chapter 25 • 26R: Jackson County Airport, Edna, TX  
MAY 03 Sebring 77 • Chapter 23 • SEF: Sebring Regional Airport, Sebring, FL  
MAY 04 Duel in the Desert • Chapter 49 • KAPV: Apple Valley Airport, Apple Valley, CA  
MAY 19 CANCELED 2018 Wildwood Acroblast • Chapter 58 • KWWD: Cape May County Airport, Wildwood, NJ  
JUN 01 Ben Lowell Aerial Confrontation & 2018 IAC West Open Championship  
Chapter 12 • KFMM: Fort Morgan Municipal Airport, Fort Morgan, CO  
JUN 01 Coalanga Western Showdown • Chapter 38 • C80: New Coalanga Municipal Airport, Coalanga, CA  
JUN 08 Bear Creek Bash 2018 • Chapter 3 • KRMG: Richard B. Russell Regional Airport, Rome, GA  
JUN 09 Giles Henderson Memorial Challenge • Chapter 31 • SLO: Salem-Leckrone Airport, Salem, IL  
JUN 15 CANCELED Ohio Aerobatic Open • Chapter 34 • KEDJ: Bellefontaine Regional Airport, Bellefontaine, OH  
JUN 16 Flagstaff Regional Contest • AC Chapter 7 • CLK6: Flagstaff Regional Airport, Killam, AB, Canada

JUN 22 Apple Cup • Chapter 67 • KEPH: Ephrata Municipal Airport, Ephrata, WA  
JUN 22 Lone Star Aerobatic Championships • Chapter 24 • KGVI: North Texas Regional Airport, Sherman, TX  
JUL 13 Green Mountain Aerobatics Contest • Chapter 35 • KVSF: Harness State Airport, Springfield, VT  
JUL 13 High Planes Hotpoxia Fest • Chapter 12 • KSTK: Sterling Municipal Airport, Sterling, CO  
JUL 13 The Corvallis Corkscrew • Chapter 77 • KCVO: Corvallis Municipal Airport, Corvallis, OR  
JUL 14 Michigan Aerobic Open • Chapter 88 • 3CM: James Clements Municipal Airport, Bay City, MI  
JUL 14 Super D Tango • Chapter 24 • XA68: Akronville Airport, Slidell, TX  
AUG 04 Doug Yost Challenge • Chapter 78 • KSPW: Spencer Municipal Airport, Spencer, IA  
AUG 10 Can-Am Championship • Chapter 67 • KCTB: Cut Bank International Airport, Cut Bank, MT  
AUG 17 Kathy Jaffe Challenge • Chapter 52 • KVAY: South Jersey Regional Airport, Mount Holly, NJ  
AUG 17 Upper Canada Open • AC Chapter 3 • CYHS: Hanover Saugeen Municipal Airport, Hanover, ON Canada  
SEP 01 ¡Viva Santa Maria! • Chapter 26 • KSMX: Santa Maria Public Airport, Santa Maria, CA  
SEP 08 Apple Turnover • Chapter 67 • KEPH: Ephrata Municipal Airport, Ephrata, WA  
SEP 08 ACE's High Aerobatic Contest • Chapter 119 • KEWK: Newton City/County Airport, Newton, KS  
SEP 08 East Coast Aerobatic Contest • Chapter 11 • KHWF: Warrenton-Fauquier Airport, Warrenton, VA  
SEP 22 U.S. National Aerobatic Championships • KOSH: Wittman Regional Airport, Oshkosh, WI  
OCT 06 The Clyde Cable Rocky Mountain Aerobic Contest • Chapter 5 • KLAA: Lamar Municipal Airport, Lamar, CO  
OCT 12 Texas Hill Country Hammerfest • Chapter 107 • KAQQ: Llano Municipal Airport, Llano, TX  
OCT 19 Akrofest • Chapter 36 • L08: Borrego Valley Airport, Borrego Springs, CA  
OCT 19 Mason-Dixon Clash • Chapter 19 • KFVX: Farmville Regional Airport, Farmville, VA  
OCT 19 Phil Schacht Fly Like Your Hair is on Fire • Chapter 288 • 42J: Keystone Airpark, Keystone Heights, FL  
NOV 01 Sebring 78 • Chapter 23 • SEF: Sebring Regional Airport, Sebring, FL  
NOV 02 The Tequila Cup • Chapter 62 • AVQ: Marana Regional Airport, Marana, AZ

# 2018

## AEROBATIC CONTEST CALENDAR

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

2018 US Advanced Aerobatic Team pilot A.J. Wilder

Poster design and photo by Evan Peers. © Airspace Media & International Aerobatic Club, Inc.





PREVIOUSLY PUBLISHED IN  
SPORT AVIATION, MAY 1974

BY MIKE HEUER, IAC 4

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**Can you beat an open-cockpit biplane for pure fun flying, satisfaction, and enjoyment?**

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I don't think so. So, you can understand my feelings when designer Paul Poberezny asked me to fly the EAA Super Acro Sport N5AC and write an evaluation for *Sport Aviation*.





# S

ince I first saw the completed airplane in Sherman, Texas, in September 1972, this pretty little bird has been one of my favorites. It's just about the right size, in my opinion, being larger than some of the other small biplanes, yet not so big as to be heavy and unwieldy. It is nimble but not twitchy. Paul asked me to fly the bird at that time, but since I was going through U.S. Air Force pilot training at the time and was not current in light aircraft, I very reluctantly turned him down.

My next opportunity to fly the Acro Sport came in the summer of 1973. At that time my father, Bob Heuer, was flying the airplane in air shows, and I got the opportunity to fly the prototype Acro Sport N1AC and later the Super Acro Sport N5AC. However, I did not really get to properly evaluate the airplane but did have a heck of a lot of fun.

For an article for *Sport Aviation*, which so many Acro Sport builders would read and potential builders as well, I decided that a complete, accurate appraisal would have to be made. Reports of Acros nearing completion have been reaching headquarters, with some builders claiming that they will be flying this spring. So it seemed to me that many of these fellas would want to know what to expect and how the airplane will react.

On my drive to the EAA facility at Burlington, Wisconsin, where the Super Acro Sport is hangared, I decided the best way to approach the airplane would be from an average sport pilot's point of view. Much has been written about the airplane's aerobatic capabilities and thousands of EAA members have witnessed the airplane flown in aerobatic demonstrations at EAA Oshkosh and other fly-ins. The airplane's aerobatic capabilities are great. It can do any maneuver in the book. This has been shown by pilots with abilities and experience far beyond my own.

But what about the Super Acro as a sport plane with maybe just a little aerobatics thrown in once in a while. In a nutshell, it's nearly perfect. Let me describe my flight and the impressions I had of the Super Acro Sport.

The Super Acro is a conventional design. Consisting of a steel tubing fuselage, wood wings, fabric covering, and Lycoming engine, the Acro really isn't anything new as far as design features go, but what makes it distinctive is that all these things have been put together uncommonly well and the design is exceptionally pleasing and attractive in appearance. The paint scheme, designed by Jack Cox, is particularly pleasing. It has been said that any good-looking airplane just has to fly good. Can this be said of the Super Acro? We'll see.

Walk-around inspection was conventional. After checking in the cockpit that the mag switch is off, mixture is lean, and the throttle closed, I started at the prop. The Super Acro swings a Sensenich 76EM8-0-60 on the 200-hp Lycoming IO-360-A2A under the cowl. The Camloc fasteners on the side cowls open easily with a screwdriver to expose the sides of the engine. There sure is a lot of engine, accessories, and lines stuffed into a little space. It presents no problem, though. The slop tank that picks up oil thrown out during aerobatics is on the right side as is the inverted oil valve mounted on the firewall. Everything checked out fine. The engine mount is slightly shorter on the Super Acro to accommodate the increased weight of the big Lycoming. This makes things a little tight but no worse than many other small biplanes.

Continuing the walk-around, I noted the J-3 style landing gear installed on the airplane, which makes up for ham-handed pilots with nice, soft touchdowns. The landing gear tread is a surprising 5 feet, 10 inches. Superior ground handling features should result.

Just forward of the cabane struts and aft of the firewall is the easy-to-get-to gas cap. Taking a flashlight to visually check the fuel level, I noted the flexible "flop tube" installed that picks up fuel in all flight attitudes. The tank holds 20 gallons, which provides more fuel than most would ever need. You could figure a two-hour range, depending on engine type, with a comfortable reserve. Just aft of the fuel tank is the 5-gallon smoke tank, which could be converted to fuel for the less air show-minded types in the group.

Coming to the wings, the Super Acro has a different airfoil than the standard Acro Sport N1AC. The Super Acro uses a 23012 airfoil, which is nearly, though not perfectly, symmetrical. This was designed for better outside, inverted performance than can be expected with the M-6 airfoil featured on the standard



Acro Sport. From a construction standpoint, the only differences would be the use of a different rib layout, slightly altered aileron bellcrank mechanisms, and aileron hinge brackets.

Completing the preflight inspection, one finds that the design is very straightforward and simple. No specially made, machined parts are required. This should be an airplane that is easy to build. The tail surfaces are large and should provide very good control. There is a lot of wing area, 115.5 square feet, for docile handling characteristics. The 200-hp engine should provide some really outstanding performance, especially considering the 35°F temperature we had on the day of this flight. At full gross weight, power loading figures to be 6.75 pounds per horsepower. However, at my weight and fuel load, the ratio is considerably better.

Before climbing into the cockpit, I drained the fuel strainer, which is located in the belly of the airplane attached to the seat structure and jutting through the fabric. Climbing into the cockpit, the first thing you notice is the phenomenal amount of room in the cockpit. This airplane is ideal for large people. There is a lot of elbowroom and legroom. The instrument panel sits just

the right distance away, easy to read but not close enough to be a hazard.

Looking over the cockpit, everything is within easy reach, convenient, and well-located. The mag switch is underneath the throttle on the left side, so as to be easily reachable only from the cockpit. The fuel shut-off valve is on the floor on the left just in front of the seat. The wobble pump is on the lower left, and it is easy to drop your hand from the throttle to the wobble for a couple shots when necessary. The fuel gauge is a simple, fail-safe clear tube that connects to the upper and lower parts of the fuel tank. No electricity or floats to rely on here. The rudder pedals are slightly too far forward for my 5-foot, 9-inch frame, but there is no problem in getting full rudder deflection. The brake pedals are a simple welded-tube design that the builder can easily make himself. With one more forward bay than most small biplanes have, there is lots of room in the front of the cockpit. You don't have your feet on the firewall in this bird. With one cushion and the Butler Security 150 parachute under me, I find I am a little high for aerobatics but for regular flying and landing it will be fine. The next thing you notice is the very long nose of this aircraft compared to

most small biplanes. This should be good for aerobatics. The instruments are placed in logical, convenient locations with little neck twisting required when going from visual to instrument references. This is good in aerobatic flying and should be a real help in the traffic pattern.

Well, I guess it's time to fly. I pushed the mixture in and gave it several pumps on the wobble to prime the engine by injecting fuel directly into the cylinders through the fuel injector. The mixture came back to lean and the switch on. Tom Poberezny pulled the prop and the engine came to life after a few blades. Just after it starts, the mixture goes to rich and you catch it with the throttle. At that point, it seems you need three hands in order to keep the stick back in your lap at the same time. After I check that the engine instruments, oil, and fuel pressure are normal, I taxi out. Taxiing is easy with no brakes required for steering. The tailwheel is very responsive because of the fairly strong steering springs that are installed. Because of the long nose, it is necessary to S-turn to see in front of the airplane, but this is typical of a lot of taildraggers. Very little power is required to taxi.

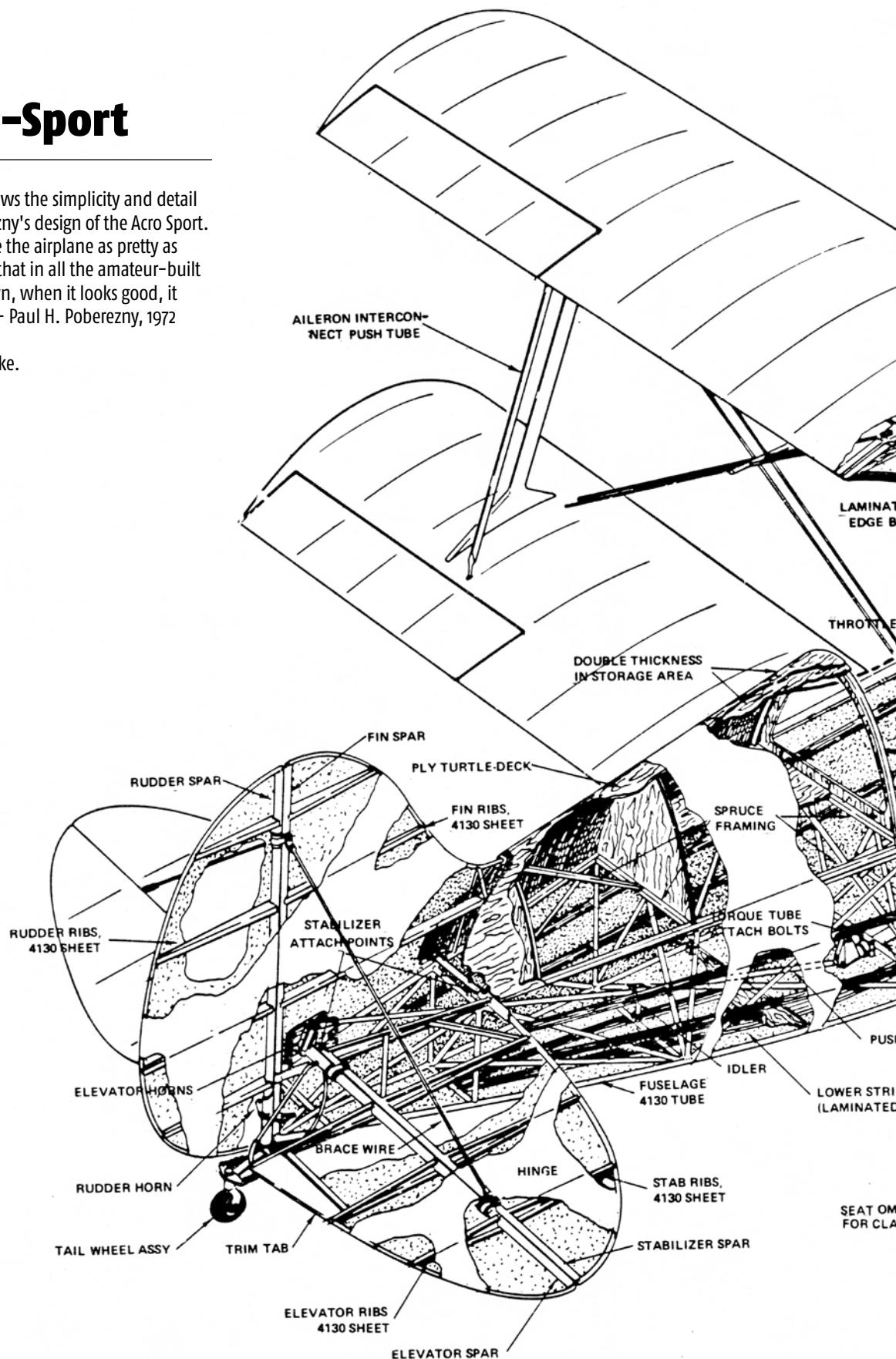


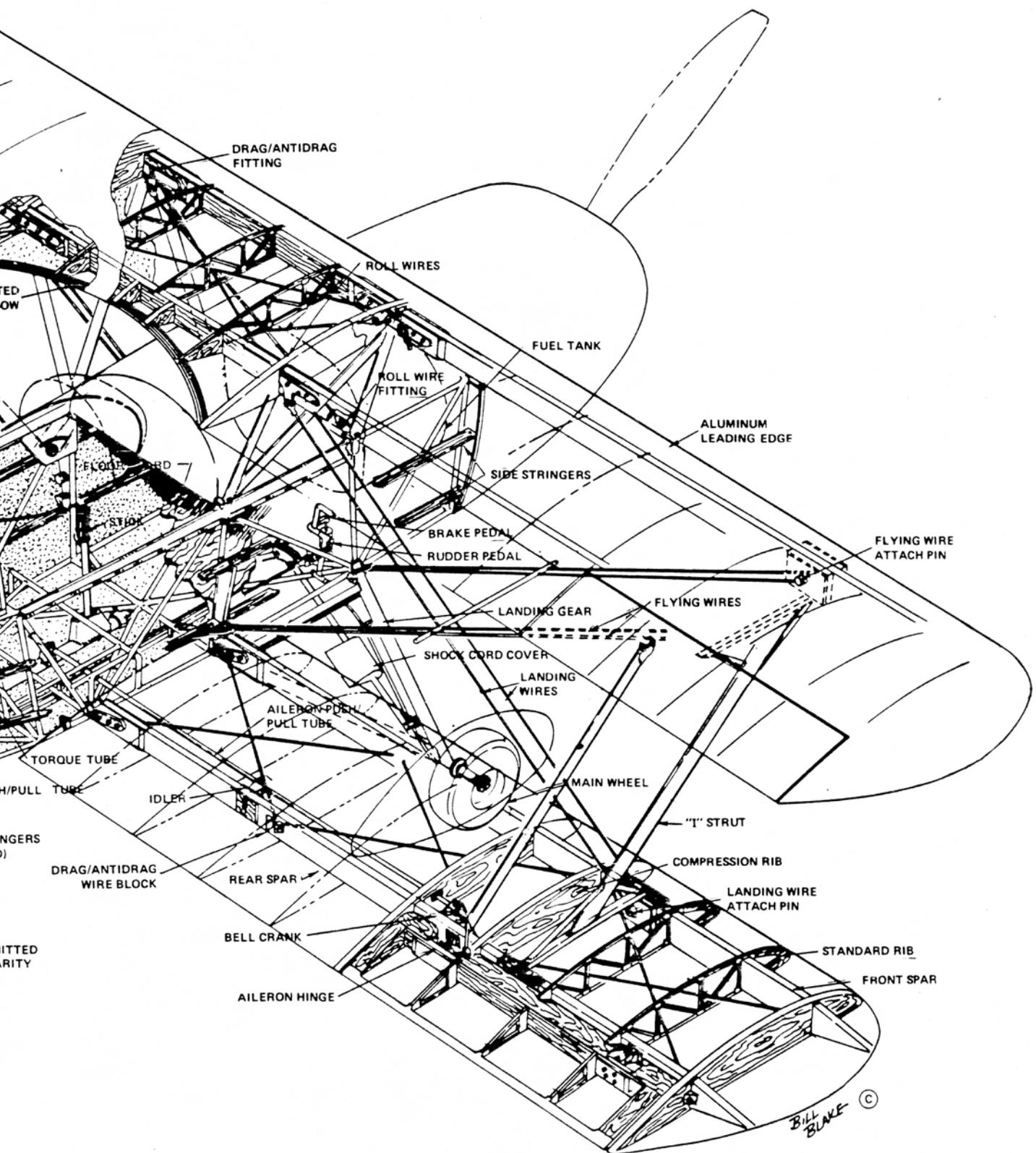
Mike Heuer next to the Acro Sport

## EAA Acro-Sport

A cutaway drawing shows the simplicity and detail present in Paul Poberezny's design of the Acro Sport. "We have tried to make the airplane as pretty as possible. I have found that in all the amateur-built aircraft that I have flown, when it looks good, it generally flies good." — Paul H. Poberezny, 1972

Technical art by Bill Blake.







After reaching the run-up area next to the runway, I set the throttle at 1000 rpm to warm up the engine, provide good air circulation through the engine, and keep the plugs from fouling. After a couple of minutes, I take it up to 1800 rpm for the mag check. They check out fine with about a 50 rpm drop on each mag. Leaving it at 1800 rpm momentarily, all the other engine instruments have normal readings, and then the throttle comes back to 1000 rpm. Going around the cockpit from left to right, the switches, valves, and instruments are set or checked and controls are free. Before pulling out onto the runway, all the belts are checked; this airplane has dual safety belts, shoulder harness, and crotch strap for aerobatics.

After all these checks are complete, I pulled the aircraft onto the runway with much anticipation. I'll confess my heart was running at a little faster pace than normal. After lining up with the centerline, I slowly fed in the throttle. With the aircraft beginning to rapidly accelerate, I said to myself, "My God, there is still more throttle left." This was my exact reaction. I thought that the power was tremendous yet I only had about three-quarters throttle. I pushed it up as far as it would go with a corresponding increase in the noise from those straight stacks just in front. The tail comes up faster than any taildragger I have flown. I tried to get it up as soon as possible for good visibility during takeoff. The Super Acro needed only minor corrections to keep it going straight with that gear tracking very well. Visibility is excellent with the tail up. What is the takeoff roll?

Well, this is a hard question to answer given the variable conditions in which you are operating, and other factors, such as the type of engine installed, fuel load, and probably most importantly, pilot technique. I held the airplane on the ground far longer than was necessary and got off in about 400-500 feet with a liftoff at about 80 mph indicated airspeed. After becoming thoroughly proficient, a fella could probably get off in less than 300 feet with a liftoff of less than 70 mph. The power is terrific and this, combined with the low wing loading, makes for a good short-field airplane.

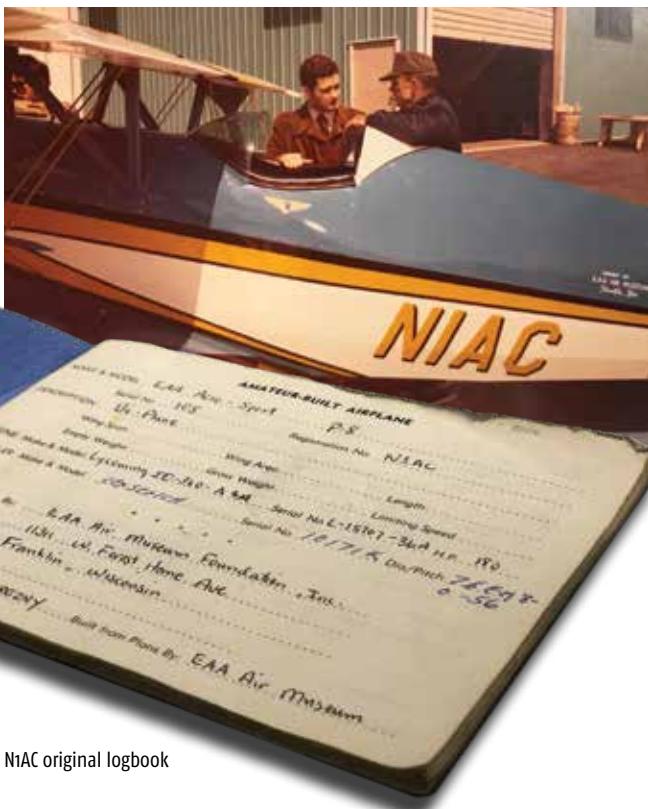
After liftoff, I established what I initially thought to be a good climb angle. Then I looked at the airspeed and it was 110 mph! So I pulled back on the stick until it reached about 95-100 mph, which I felt was close to best rate-of-climb airspeed. This established a pretty steep climb. So steep, in fact, that by the time I crossed the end of the runway I was over 1,000 feet. This airplane is going to be some kind of fun!

To get an idea of what kind of climb rate the airplane had, I punched my stopwatch just after liftoff to time the climb to 4,000 feet AGL. There was no rate-of-climb gauge installed in the aircraft, but I would estimate the initial climb rate to be in excess of 3,500 fpm. Of course, this tapers off as the nose is lowered to maintain airspeed as you climb to altitude. By the time I had departed the traffic pattern and made a 270-degree turn over the airport, I was at 4,500 feet AGL. I punched the clock again at 4,000 feet and it showed 2 minutes, 10 seconds for an average climb rate of 1,846 fpm.

I leveled the airplane off at 4,500 feet where the air was as smooth as glass. It was really a beautiful day for flying, with excellent visibility and the countryside covered white with snow. I momentarily let the airplane accelerate to cruise and held it as smoothly in level flight as I could, then reduced power to 2400 rpm. Letting the airplane settle down at this power setting for a couple of minutes, I finally got 118 mph IAS for a true airspeed of 121 mph. At 2300 rpm, indicated was 112 mph for a 115 mph true. After talking to some other pilots later, I was told that probably 2500-2600 rpm for cruise would be better, because with the flat pitch prop installed on the airplane, very little power is being pulled and higher rpm are necessary for faster cruise speeds. Live and learn, eh? With the higher power setting, an owner/pilot could expect the 130-135 mph TAS cruise, depending, of course, on powerplant and prop combination. At the time, I also had some doubts about the accuracy of the airspeed indicator in the Super Acro at the higher range. The low end seemed accurate, however.

Even though I felt the airspeed was reading slow, I ran a top speed test on it as well. Again, holding it as level as possible at full throttle and 2900 rpm yielded 147 mph IAS for a true of 151 mph.

In earlier flights of the aircraft alongside a Twin Comanche with a calibrated airspeed indicator, cruise was found to be between 125 and 130 mph IAS, and I believe this is what most owners can expect with this airplane.



NIAC original logbook

I wanted to explore the stall characteristics of the airplane next. Verne Jobst, IAC president, had remarked to me earlier, as had Bob Heuer, that he felt the docile stall characteristics were one of the most outstanding features of this design. I wanted to stall the airplane in several attitudes and power settings to find out for myself. I found out that what they said was entirely true.

The first were the power-off stalls. Establishing about a 10-degree nose-high attitude, or approximately the landing attitude, with the wings level, a very gentle burble began at 58 mph IAS with the full stall, if you can call it that, at 51 mph IAS. Rpm was at 1200. The amazing part was the very docile stall reaction, when it finally occurred, and the instant recovery upon the slightest relaxation of the stick. Power was not really necessary in stall recovery, as just a small addition of throttle would permit recovery with negligible altitude loss.

Turning stalls were much the same: very docile and straightforward. Burble began at a slightly higher airspeed, 61 mph IAS, as may be expected. Full stall occurred at 54. These were performed in approximately a 30-degree bank in both directions. Again recovery was instantaneous with little altitude loss. Characteristics were equally docile in both directions, with the airplane rolling to the top upon stalling.

Accelerated stalls were next on the agenda. I like to do these as they tell very much about the handling characteristics of an airplane. These were performed in an 80-degree bank at 2000 rpm. I gradually pulled the stick back with increasing pressure until the stall occurred. I practically had to get the stick back in my lap before it would stall. Finally, the payoff came at 64 mph IAS. I didn't notice where the burble began but there was an ample amount of warning before the stall occurred. There was no tendency for the airplane to roll to the bottom of the turn. Here again the extra wing area really paid off.

Last were power-on stalls or what the FAA calls "departure stalls." With the wings level and rpm set at 2000, I pulled the nose up to about a 60-degree angle. There was not quite as much warning in this one, but when the stall finally arrived the nose and left wing dropped gently. I tried this several times, and in all the stalls the left wing had the slightest



## EAA SUPER ACRO SPORT N5AC SPECIFICATIONS

**UPPER WINGSPAN:** 19 feet, 7 inches

**LOWER WINGSPAN:** 19 feet, 1 inch

**LENGTH:** 17 feet, 4-1/2 inches

**HEIGHT:** 6 feet

**LANDING GEAR TREAD:** 5 feet, 10 inches

**GROSS WEIGHT:** 1,350 pounds

**EMPTY WEIGHT:** 883.6 pounds

**WING AREA:** 115.5 square feet

**WING LOADING:** 11.34 pounds per square foot

**POWER LOADING (GROSS WEIGHT):** 6.75 pounds per horsepower

**FUEL CAPACITY:** 20 gallons

**SMOKE OIL (OR AUXILIARY FUEL) CAPACITY:** 5 gallons

**BAGGAGE:** 35 pounds

**MAXIMUM SPEED (REDLINE):** 180 mph

**TOP SPEED:** 156 mph

**CRUISING SPEED:** 135 mph

**STALLING SPEED:** 51 mph

**RATE OF CLIMB:** 3,700 fpm

**RANGE:** 300 miles



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tendency to drop to about 15-20 degrees before recovery. Recovery, as in the others, can be effected by small relaxation of the back-pressure. If a pilot made the kind of "departure" to bring on this stall, his head would really have to be "up and locked." Overall, I would agree wholeheartedly with the other pilots who have flown the airplane that the gentle stall characteristics are one of the most outstanding flying features of the airplane. They certainly compare with, or are even better than, most trainers in use today. Nothing unusual or even what might be considered "hot" or "tricky" was ever exhibited by this aircraft in these flight modes.

Obviously, in a forced landing situation it would be necessary to choose a field and set up an approach rather quickly to be successful. Of course, the more altitude available, the better off you would be. For those of you who will be flying soon, I would recommend lots of altitude on those first few flights and staying near the airport. I think this high sink rate characteristic of all small biplanes is really due to three factors: inherent parasite drag of the design, flat pitch props causing tremendous drag in idle, and the large diameter prop reducing lift on the inner portions of the wings by creating disturbed air. This is proven by the fact that when you crack the throttle just a little during approach you

Climbing back up to 5,000 feet and clearing the area again, spins were next on the program. Entry was made power-off and about 10 degrees nose high. These were performed in both directions. The airplane enters easily and cleanly with an immediate, fairly rapid rotation. I performed two-turn spins only and recovery was effected within 90 degrees after neutralizing the controls. I never applied forward stick or opposite rudder, but only neutralized the elevators, rudder, and ailerons. Probably with opposite control deflections, recovery would be quicker but it just wasn't necessary for what I was doing. Without rushing the pullout, I lost about 1,000 feet in the two-turn spins. With practice, I felt that altitude loss could be much less as I was pulling out gently with only about 1.5g to 2g acceleration. Overall, recovery characteristics are excellent.

After all these maneuvers were accomplished, I decided it was about time for some fun. Aerobatics is really the epitome of flying the little open-cockpit biplanes. You just can't beat the thrill and satisfaction of throwing these little beauties around the sky. I was also anxious to explore the aerobatic capabilities of this airplane as much as my currency and proficiency would permit, which unfortunately, was darned limited after being away from it for so long. Slow rolls were first. Roll rate is about 150-175 degrees per second. This was pure estimation and is subject to many factors. When roll rates are discussed, it is important to determine what these variable conditions are. Airspeed at entry, control deflection (it is hard to get full aileron all the time), and g-loading are all factors to be considered. The 150-175 degrees per second with the Super Acro Sport was at 130 mph IAS, not quite full aileron deflection, and 1g. At any rate, it is excellent, and the ailerons are very crisp without being sensitive. Aileron pressures are a little heavier than a Pitts but much lighter than a Decathlon. Hesitation rolls are easy because of the sharpness of

An excited Mike Heuer in the cockpit of N1AC outside the EAA workshop in Hales Corners, Wisconsin.

One experiment that I have always wanted to try with a small biplane was to time a power-off descent and find out how rapidly any particular design descends. I got to try this with the Super Acro Sport. Small biplanes all have the reputation of coming down rather fast, and this is very noticeable in attempting power-off landings. In doing this, I reduced power to idle, slowed to 85 mph IAS in level flight, and dumped the nose and started the stopwatch simultaneously. I lost 1,000 feet in 46 seconds, for a descent rate of 1,304 fpm.

will notice a very significant decrease in rate of descent. It has also been shown by other pilots that with engine failure and a stopped prop, rate of descent is not nearly as high as with a rotating prop in idle or wind milling. These are all factors to keep much in mind when flying your small biplane whether it be an Acro Sport, Pitts, or whatever. One final comment: Power-off landings are absolutely no sweat. I would recommend all pilots practicing these on as many landings as you can. You will gain confidence in yourself and your airplane and will be prepared for an emergency.



the ailerons and you are able to easily stop it on the points. Roll rate is about the same in both directions.

Even though you could easily do them slower, "over-the-top" maneuvers were done at about 140 mph entry speed. Loops were about 600-700 feet in diameter with 50 mph indicated over the top. Flying off the top in Immelmanns and vertical rolls is easy because of all the wing area this bird has. It will fly when other airplanes fall out of the sky. The Super Acro also has plenty of power to accelerate well from slow airspeeds.

For aerobatic competitors, this translates into a little easier time staying in the aerobatic zone at contests. For others who don't compete, it means that you have an airplane with very forgiving aerobatic qualities.

As far as some of the other maneuvers are concerned, I did little other than the basic ones. I have seen the

airplane perform a double vertical roll. In fact, Bob Heuer did this on his first flight in the aircraft. Both Bob and Verne have said to me that the outside looping maneuvers are easily performed with the 23012 wing, and entry speeds are about the same as inside maneuvers.

aerobic capabilities. Either way, it's a great combination. There is something for everyone in the Super Acro Sport.

Regretfully, it came time to land, and here is where some more pleasant surprises unfolded. I entered the 45 to the downwind at 1,000 feet AGL

## IT IS A FINE DESIGN BY PAUL POBEREZNY, A REALLY SAFE, DOCILE AIRPLANE THAT WILL PLEASE MANY OWNERS. IT IS NOT SENSITIVE ON THE CONTROLS AND IS A PLEASURE TO FLY.

What does all this mean to the sport flyer? You could go as far as you want to in aerobatics with this bird. Or if you don't care about that, you can sit smugly in the cockpit with the feeling that the airplane you are flying has unlimited

at 130 mph IAS at 2400 rpm. Not having landed a taildragger for several months, I was a little apprehensive and prepared for the worst. Opposite the end of the runway, I closed the throttle and slowed to 100 mph.

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With the wind blowing the way it was, about 10 knots and a slight crosswind, I turned onto base a little over a quarter of a mile from the end of the runway. I decided this first landing would have a power-on approach as my proficiency was down and this was easier. Just a little power is all that is required, perhaps a 1/2- to 1-inch throttle movement. This

tended to over control a bit. Movements of perhaps an inch are required on the rudder pedals to keep the bird going straight, and I wonder if even that much is necessary. My compliments go to Paul Poberezny for putting that wide, soft gear on the airplane and to the mechanics in the EAA shop for putting the gear on so straight and true.

Over control should not be a problem if a pilot thoroughly familiarizes himself with the airplane up in the air in many different flight modes before coming into the pattern. When you fly the airplane, go up to 6,000 feet and pretend there is a runway at 5,000 feet. Go through the whole approach, flare, and everything (except the rollout, of course). This works well for familiarizing yourself with control pressures, aircraft attitudes, and power settings. Also, be aware that the airplane will slow down rapidly upon idling the engine.

In many ways, for the pilot used to the larger trainers, this airplane will be easier to fly because of the overabundance of control. When you make a control input, you will get response with no hesitation. This is not sensitivity but just plenty of control surface power. There is a difference.

For those Acros with bigger engines such as the 180- and 200-hp Lycomings, the tail is slightly light and this bears watching on soft surfaces and rough taxiways and strips, as might be expected. Hard braking should not occur until the stick is all the way back in your lap on landing, which you should try to do as soon as possible to maximize tailwheel control.

For those of you who are building and will be flying Acros with smaller engines, such as the Teledyne Continental O-200 or others, I think you will find this a nice combination. With the lighter weight of the smaller engines, you will have correspondingly lower wing loading and landing speeds and generally more docile handling characteristics. Other offshoot advantages would be easier engine maintenance due to more room in the engine compartment and lower building and operating costs.

In summary, how would I briefly describe the airplane? Well, it is a fine design by Paul Poberezny, a really safe, docile airplane that will please many owners. It is not sensitive on the controls and is a pleasure to fly.

All I can say is that I am very envious of those who own one. **IACI**



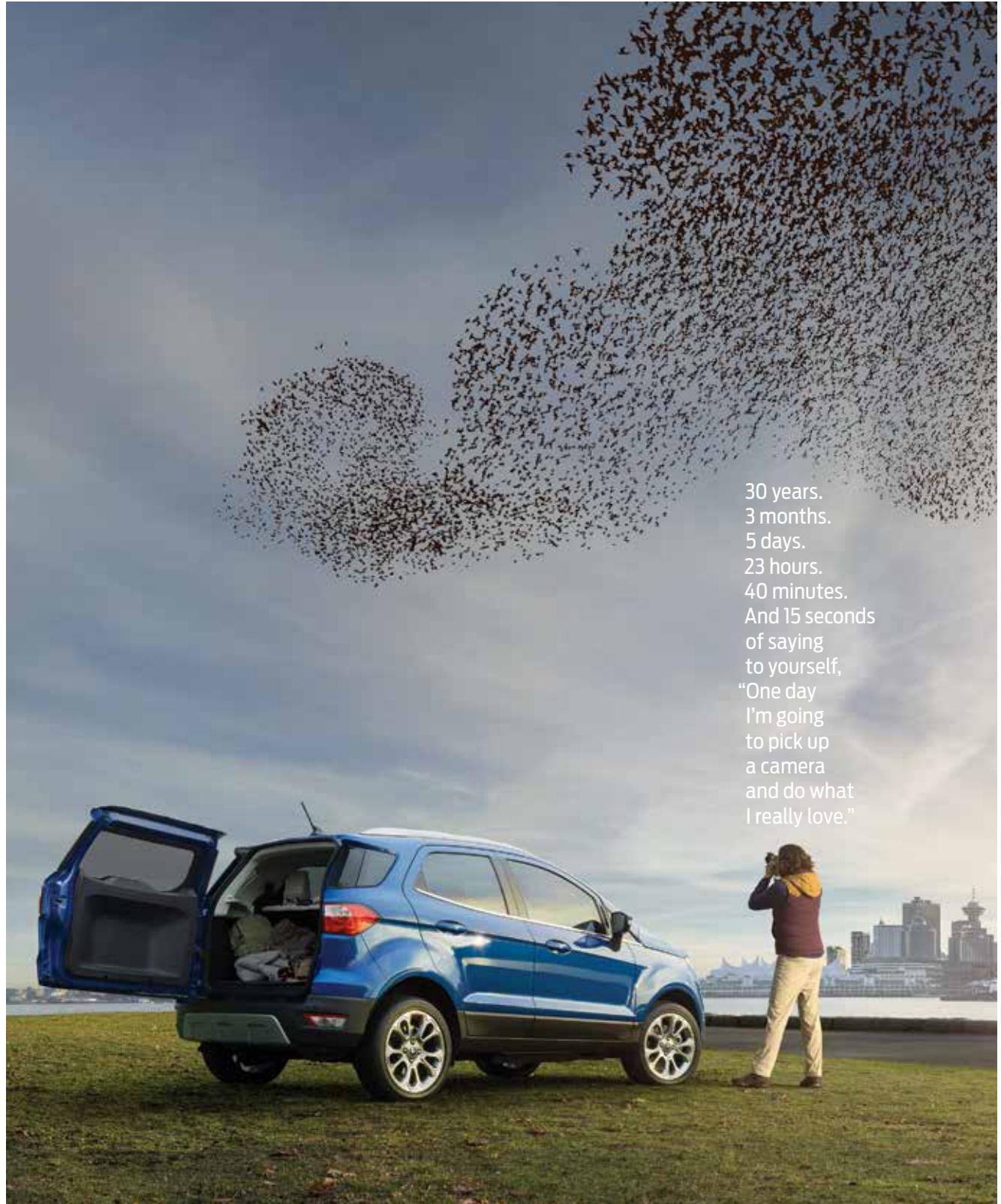
A Super Acro Sport formation takeoff with its sister, the Acro Sport II.

makes for a reasonable rate of descent. Base was flown at 90 mph. Turning to final, airspeed was maintained at 90 mph. Airspeed is easy to kill off when necessary, and by keeping the airspeed a little hot on final, visibility is a little better at the lower angle-of-attack. Even at 90, however, visibility directly in front is practically nonexistent. I found it easier to lean to the left to see. Many pilots use a sideslip for better visibility, also. The blindness can be a problem to a pilot not used to it at first but, again, a little practice and you get used to it. Carrying just a little power, I closed the throttle crossing the fence at 85 mph. The airplane floated down the runway a little longer than I'd like after I flared the airplane. Touchdown came about 800 feet down the runway, and I prepared myself for immediate corrections on the rudder. I was very pleasantly surprised that practically none are required, even though there was a 20-degree crosswind and I

After taxiing back, I performed several more landings, both touch-and-goes and full stops. Again, no problems on rollout or in the pattern were encountered. Touch-and-goes are a real blast, because before you've got the throttle half-open, you're airborne! Approaches were made both with power and without. Of course, the power-off patterns are quite tight and have to be planned better.

I had done wheel landings in the airplane previously, and it does good ones. I did try one this time, too, but due to my own ham-handedness it was not successful, and I had to take it around. Landing roll is about 1,000 feet with small brake applications.

What kind of experience do you have to have to fly the Acro? Low time pilots with taildragger time should have few problems. I would recommend flying a Citabria or a similar bird from the back seat with someone in the front to get used to the blindness on the approach.



30 years.  
3 months.  
5 days.  
23 hours.  
40 minutes.  
And 15 seconds  
of saying  
to yourself,  
“One day  
I’m going  
to pick up  
a camera  
and do what  
I really love.”

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# 2018 SPORTSMAN **Sequence** PART 2

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

# W

Welcome to Part 2 of the 2018 Sportsman Known sequence. For those of you who are just tuning in, these articles are written mostly for fairly new Decathlon or Citabria-type pilots who may have just completed the basic 10-hour aerobatics course and CFIs who have taught regular barnstormer-type aerobatics for a while but are new to the competition scene.

The late, great Sportsman champion Giles Henderson said, “Energy management is something the pilot does with the right hand, not the left.” I agree — we want to discern and reward pilot ability, not horsepower.

The difficult parts of this sequence for low-horsepower, high-drag airplanes are maneuvers 5, 6, and 7. Before and after these three maneuvers this sequence has a nice, high-energy flow. Being as fast as you can for these three problem maneuvers will help you. Learn to fly fast. Most airplanes show better when fast. With training, one can fly fast, still be smooth, and still be nice to the airplane.

Remember, your airspeed redline isn’t a limit; it is a goal!

## SAFETY

*The book Stick and Rudder says that a horse has different gaits, like the trot or the gallop, and they each have a different feel. So it is with the airplane. Listen to the horse.*

One of the best books ever written about flying, even though it was written in the late ’40s, is *Stick and Rudder* by engineer and test pilot Wolfgang Langewiesche. He said that a horse has gaits — like walk, trot, canter, and gallop — and each gait has a different feel. It is the same with airplanes, especially the high angle of attack, mushy pre-stall gait.

The rider and the pilot must be sensitive to the feel of their mounts in each gait.

If the rider is trying command a horse to jump a fence that is too high, the horse won’t do it. The horse may send the rider over the fence, but the horse won’t go. The horse knows if it can’t do a maneuver.

*Listen to the horse.*

An airplane is the same. If you are trying to do a maneuver but the airplane has a “mushy” feel or if the tip of the nose is not responding to pitch commands, then the airplane (the horse) is telling you it can’t do what you are asking. It is talking to you through the reins and through the saddle.

*Listen to the horse.*

As long as the airplane’s CG is in the proper envelope, it has natural stability and it will initially resist departing from controlled flight, but only for a short period of time. If the airplane begins to do something you did not expect, abandon the maneuver *immediately*.

Aggressively centering the rudder pedals and the stick, and getting the power back once the nose is close to or below the horizon, will normally keep the airplane from departing controlled flight.

In the movie *Top Gun*, Viper, the instructor, said that when dogfighting the pilot shouldn’t push a bad position but should instead extend and escape. Even better, former IAC President Rob Dorsey said aerobatics is a *hobby*! We are not curing cancer or bombing Berlin. Come back and try again.

Maneuvers 6 and 7 might demand a break by low-horsepower, high-drag airplanes, or by those with the added weight of a safety pilot on board. Remember from Part 1, it is better mathematically to take a break with its penalty, or take the “out” penalty, than it is to fly a tightened, truncated maneuver that scores badly.

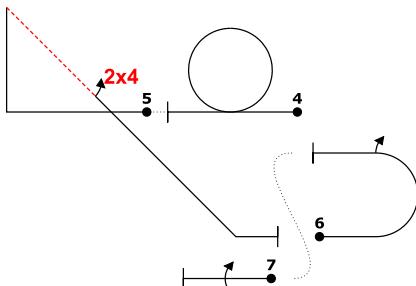
More importantly, the flying of a “squeezed” maneuver by new (and not so new) pilots, in an attempt to stay in bounds, is what frequently causes unsafe flying. Beware of this, take the out, or take a break. Your flying will not only be safer, you will also score higher.

## OVERVIEW

The key to aerobatics, as said by 1972 World Champion Charlie Hillard, is knowing “where to look and when.” As you think about the sequence, think about *when* you are looking over the nose, and *when* you are looking past your sight gauge or wingtip to the horizon. As you mentally walk through the sequence, using your hands as you go, think about where you are looking at that moment and tie that in with the control movements you will be making at each moment.

Also try to maintain what aerobatic coach John Morrissey calls “deep focus,” in which he maintains that a “clear and distinct focus to the furthest point ahead of the aircraft’s flight path must be maintained.” In level flight he wants pilots to focus on a spot 20 miles away. When pilots are on a downline he says, “I want them to pick out blades of grass.” Keep these things in mind throughout the sequence. This is especially important in any of the aileron (slow) rolls.

Your eyes naturally go to an at-rest focus point about 30-60 feet away in what is called “infinity focus.” You must consciously refocus on something farther away from the aircraft about every five seconds to maintain deep focus.



Maneuver 7, the competition aileron roll (slow roll), is the key to this sequence.

#### SEQUENCE PLANNING

This sequence has a great high-energy flow until maneuvers 5, 6, and 7. Maneuvers 6 and 7 are energy killers for low-horsepower, high-drag airplanes, or for an aircraft with a safety pilot on board.

Rob famously said that the aerobatic sequence is like a good game of billiards. It is not enough to make a good shot. Afterward, the cue ball must stop in a good place for making the next shot. You've got to think a couple of chess moves ahead.

Maneuver No. 5 requires a lot of entry speed for a low-horsepower, high-drag airplane to show the vertical line that the judges can actually see. These aircraft need to hold the downline long enough from the end of the hammerhead, maneuver No. 3, to acquire the energy needed to get through the loop with enough speed to then show the vertical line in maneuver No. 5.



#### THE AILERON (SLOW) ROLL

Maneuver No. 7, the competition aileron roll (slow roll), is the key to this sequence. Remember from Part 1, when performing a well-scoring aileron roll, a pilot must hold enough top rudder in knife-edge flight, and a high enough nose attitude in inverted flight, so their center of gravity "dot" makes a straight line through the roll. Low-power/high-drag aircraft require very nose-high attitudes in both of these cases when their speed is low, such as it would be when beginning the roll after exiting the Immelmann.

The problems on maneuver No. 7 are judging and aircraft control.

As to judging, the illustration above of a low-horsepower, high-drag aircraft should be scored as a 10. When looking at the nose and tail above, judges have sometimes called the roll "barreled." The nose and tail of the above aircraft will be nodding up and down, but the flight path of the center of gravity dot is *not* drawing a corkscrew line around a "barrel."

The IAC judging training organization is working hard to correct this common judging error, but the pilots must do everything possible to perform for their flawed, human judges. When an aircraft is flown faster it will require less top rudder and a lesser, inverted nose-up attitude to perform the roll. Any extra speed out of the Immelmann will make the following roll look and score better.

As to aircraft control, we are really talking about two rolls, not one. There is the half-roll that finishes the Immelmann, which is a speed killer, and then maneuver No. 7 itself.

At slow speeds the rudder and stick inputs are pretty large. This makes the chance of departing controlled flight greater. As I said previously, *listen to the horse*.

With maneuver No. 7 as the key, I might suggest making the downline at the end of maneuver No. 5 longer until you can begin maneuver No. 6 above its minimum needed speed.

Know exactly what minimum entry speed, and entry altitude, you need to safely do the Immelmann in your aircraft. *Make this a decision point*. Write it on your sequence card! Then, if you do not have that required minimum entry speed at the end of maneuver No. 5 take a break (wing wag), climb, come back around, dive, resume (wing wag), and show us a perfect Immelmann and slow roll. With some aircraft it might be a good idea to plan this break.

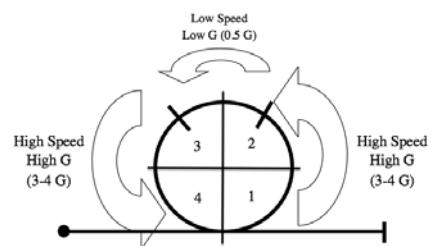
Unfortunately, making the downlines longer from maneuver No. 3 and maneuver No. 5 will result in more altitude loss. Once you know how much altitude you are going to lose in maneuvers 3, 5, and 10, you can work your way backward through the sequence to determine the starting altitude for maneuver No. 1, and for the beginning altitude to allow for good-looking wing wags.

#### THE MANEUVERS

##### ► THE IMMELMANN

The Immelmann can be the bane of new competitor's existence, and one of his or her highest causes of frustration. We've already covered how the half-roll can turn into an inverted spin entry. The second problem is finishing the half-loop early. The half-loop must finish directly above where it began, meaning the pilot must compensate for wind. The third problem is sagging or settling after the roll. The last problem is finishing off heading.

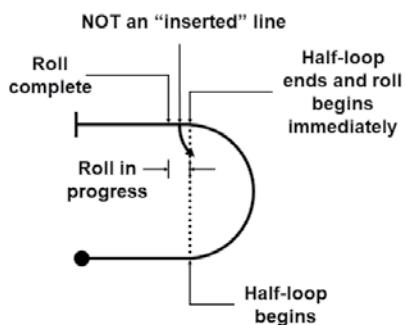
Last month I discussed dividing up the loop into quarters for analysis. Loop analysis is necessary for maneuvers 6, 9, and 10. *Quarter No. 1 is free and sets the standard*. Whatever radius is drawn during the initial pull up in quarter No. 1 must be re-created in quarters 2, 3, and 4. Quarters 2 and 3 are the hardest to draw over the top of the loop as the airplane's energy state is at its lowest.



##### ► THE LOOP

In maneuver No. 6 you are just leaving the loop at the end of quarter No. 2. As in the full loop, pull enough g in quarter 1, at least 3.5g, to make it small, enabling you to duplicate its size in quarter No. 2. Most of you don't have the horsepower to fly around a larger circle.

Be careful when initiating the half-roll. The recommendations in all of the aerobatic books are that the Immelmann should be started with 5-10 mph above normal looping speed, the looping segment should be flown with 1/2g more than normal for a loop in quarter No. 1 in your particular aircraft, and to not float the top of the half-loop. These three actions should feed enough energy into the half-roll segment and keep you from finishing the half-loop segment early.



There also must not be a line drawn between the finish of the looping segment and the beginning of the roll. They must *not*, however, be blended together. To quote "the Good Book," "This criterion (no line) is not meant to imply that one element (roll or loop) must start before the preceding element is completely finished. A brief hesitation between elements (similar to opposite rolls) *must not be downgraded*."

Remember from the safety section above, you lose *fewer* points by taking a break than you do by flying it badly due to not having enough energy, or by getting a zero by falling out of it.

#### ► THE AILERON (SLOW) ROLL

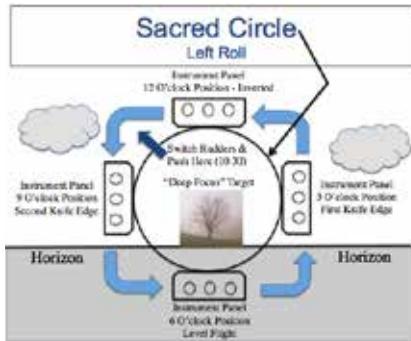
The elements and techniques for the aileron (slow) roll apply to the partial rolls in the half-Cuban (No. 10), the goldfish (No. 9), and the wedge (No. 5).

The main problem in this maneuver is that people do not maintain the straight path before, during, and after the roll. Sinking during the roll is quite common, especially in the inverted and second knife-edge portions of the roll.

Another problem is not maintaining a constant roll rate. Most pilots allow the roll rate to speed up in the second half of the roll. The in-roll rudder couples to accelerate the roll.

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

As we covered in Part 1, the key to a good competition aileron (slow) roll is picking a spot on the horizon, and then drawing Alan Cassidy's "sacred circle" with the tip of the nose around that spot. John's deep focus must be maintained throughout the roll.

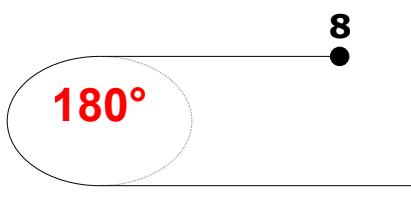


As discussed in Part 1, a good trick taught to me by Emerson Stewart was to not switch the rudders (when switching to the other top rudder) when passing through the 12 o'clock position, but to wait until about the 10:30 position.

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

This push will fix the problem of ending off heading to the right all the time.

Once the rudder pedals are switched, the roll rate will increase, which is a downgrade. Ease off the aileron deflection a bit when the rudder pedals are switched so the roll rate stays the same.



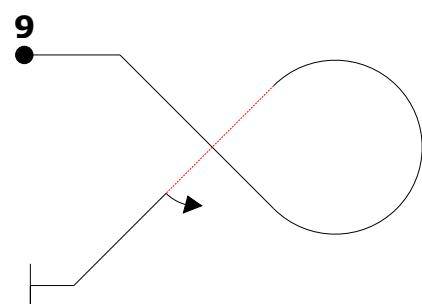
#### ► 180-DEGREE AEROBATIC TURN

Most new competitors don't hold enough bank angle in aerobatic turns. The judging criteria require that the turn must be 60 degrees of bank *minimum*.

There must be an observable pause between the roll in, the turn, and the rollout. Also, the roll in and the roll out must be at the same roll rate. The rookie mistake is to roll in fast and roll out slow.

To coordinate, or not to coordinate, that is the question. Actually, both are correct.

The steps in the maneuver are: 1) a coordinated roll to 60 degrees of bank or more; 2) an uncoordinated *pause* using elevator to maintain the roll-in heading and top rudder to hold altitude; 3) a coordinated pull, with *constant* bank and ball back in the center, to the new heading; 4) an uncoordinated *pause*, again using pitch to maintain the finish heading and top rudder to hold altitude; 5) a coordinated roll back to wings level. Altitude must be maintained throughout.



#### ► THE GOLDFISH

This maneuver has three elements that must be conquered. First, the pilot must make the 3/4 of a loop a constant radius *without pinching the top*. The other two elements are those darn 45s and centering the roll.

Maneuver No. 9 is just like the regular loop. You are just leaving the three quarter-loop in the middle of quarter No. 3 to do the second 45-degree downline. As in the full loop, pull enough g as you come off the first 45-degree downline and into quarter No. 1 to make it small, enabling you to duplicate its size in quarter No. 2 and through half of quarter No. 3.

As for centering the roll, until ground coaching helps you make an adjustment, make the line before and the line after the roll equal in *time*. It is not perfect, but it is a place to start. With coaching you will find that you'll need to spend slightly longer on the slower line (before the roll) than the faster line (after the roll) to make them equal in *distance*, but the timing difference is not a 2-for-1 ratio. This also applies to maneuver No. 10.

Flying the 45s well depends on the pilot's eye position.



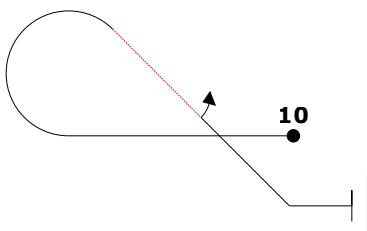
Whatever sighting system is used, it is very important that the pilot be absolutely consistent about seating position. Always sit so that the eye position, and its relation to the sighting system or airplane structure, is the same on every flight.

You must maintain the same line before, during, and after the roll. See the aileron roll about this.

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

In this maneuver people usually pinch the top of the looping segment, which is a score downgrade. The end of the looping segment, before the last 45-degree downline begins, *must* be rounded out enough so that the radius of the 3/4 loop is constant throughout. That takes energy.

The looping segment must be started with enough energy to fly that constant radius. Pulling the necessary beginning g's will scrub off speed, so the first 45-degree downline must be held until the proper speed is attained before pulling up into the 3/4 loop. Learn that entry speed for your airplane.



#### ► THE HALF-CUBAN

This maneuver has the same three elements that must be conquered as the goldfish. First, they must make the 5/8 of a loop a constant radius *without pinching the top*. The other two elements are another of those darn 45s and centering the roll. Most of the details covered in the goldfish also apply to this maneuver.

Remember to finish with wing wags that look snappy!

#### FINAL THOUGHTS

The Sportsman category is unique in that the pilot can pick his or her level of participation. First of all, there is no Unknown.

How well a pilot does is directly proportional to how much fuel goes through their fuel injectors. To compete with meager resources a pilot might elect to fly the Known three times, which would require less practice time than flying the Known and a Freestyle.

In Sportsman, whatever sequence is flown on the second flight is also flown on the third flight. That takes the place of the Unknown. If you fly a Freestyle your order of flights would be Known, Freestyle, Freestyle.

If time and resources permit I always *highly* recommend flying a Freestyle sequence. It is okay to use someone else's. First and foremost, in a Freestyle you can leave out the loop that is the bane of the new pilots' existence!

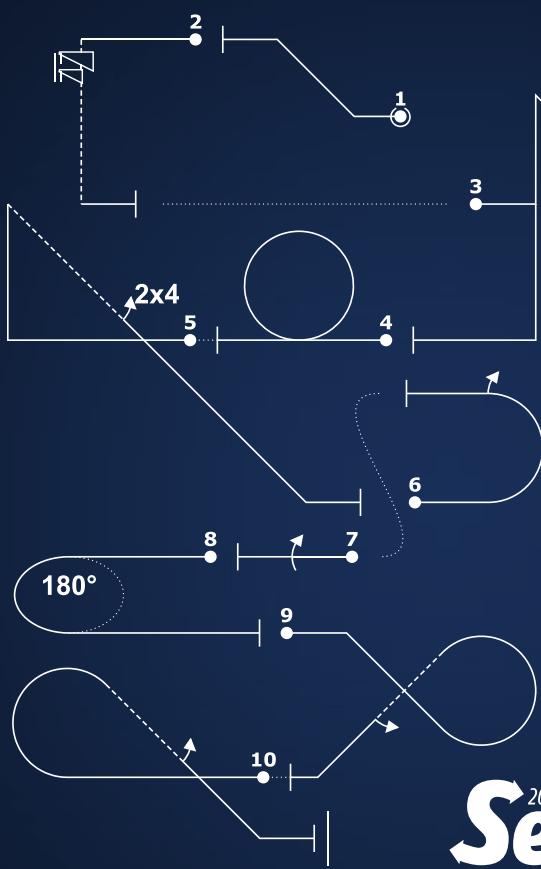
But let us go further. Remember that this activity is also about

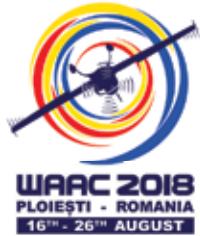
education and about expanding who you are. The pilot can use this category as a springboard to higher categories, or stay there for a lifetime. In either case the Freestyle is a great place for education and self-challenge.

If a Freestyle is designed to show off your airplane's attributes (and to hide what it doesn't do well, like the loop!), it can earn you higher scores (10 percent), as well as be a lot of fun. And you get to fly the Freestyle twice!

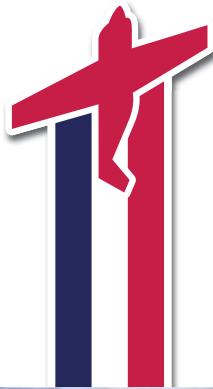
Back to the 2018 Sportsman Known sequence, whether a pilot is staying in Sportsman forever or trying to move up, a Freestyle is challenging and fun. In this Known there are many pieces, or strings of maneuvers, that would fit nicely in a Freestyle. In your Freestyle you can reduce the amount of maneuvers that would be hard on your particular aircraft, especially if it is a low-horsepower, high-drag aircraft.

Watch your redlines, watch your altitudes, wear your parachute, and have fun! **IACI**





**With your help,  
we will take on the world.**



## The road to victory has no outs.

We are proud to represent the United States of America at the 2018 World Advanced Aerobatic Championships in Ploiești, Romania, vying against the best aerobatic pilots in the world.

The team extends our thanks for generous donations by Bill McLean, IAC Chapter 23 through Chris Magon, Jim Wheaton, IAC Chapter 677 through Jerald Lewark, and Jim Risher Airshows through donations in memory of Jim.

Thank you for helping us keep our eye on the road and our focus on flying our ultimate best to achieve victory.



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## The Professor

BY MICHAEL LENTS, IAC LIFETIME 434331

### AN EARLY START

**MY AVIATION JOURNEY STARTED** at a young age. On Microsoft Flight Simulator, I flew a Sopwith Camel out of Meigs Field in Chicago dodging buildings using nothing but a keyboard. I watched *Wings* on the Discovery Channel with my father and drooled over specs for the F-14. Family vacations didn't seem complete unless there was a detour to Dayton, Ohio, and a visit to the National Museum of the U.S. Air Force. I love the technology and the artistry, the engagement required between human and machine in full-envelope flying.

I began flight training the first week of my college career at the University of North Dakota. After earning the certificates needed to become employed as a commercial pilot, I finally took the time to take the one course I had dreamt of: Introduction to Aerobatics. It was the chance to put the technology down and delve into what I had imagined flying was all about.

I learned basic aerobatics in Super Decathlons at UND from Pete Schumacher. Retired from the Air Force, he had flown F-4s and instructed in A-10s. He instilled in me the drive to be precise and smooth, to manage energy and fly safe aerobatics. He spoke of mock dogfights where his mentors could line up targets so smoothly you would trust your grandmother to ride backseat and quietly read without being disturbed. Finding a way of making this a permanent part of my professional career path became my new goal.

I began flight instructing while completing my degree, and after some time managed my own group of instructors at UND. In 2006, my dreams became reality as I began teaching aerobatics and spin training. In 2008, I became a safety pilot and coach for the UND Aerobatic Team. Eventually taking over as head coach, I helped manage the aerobatic program at UND. I moved over to the academic side and currently lecture for the university while actively staying inverted in the Super D. All of that is a long story to introduce that I love the Super Decathlon.

### IN THE HUNT

I made some great friends through competition. Of the many supporters who encourage my students and collegiate team, Aaron McCartan and I formed a fun rivalry. It mainly involved me chasing him through the categories from Sportsman into Intermediate and finally Advanced. We attended training with John and Linda Morrissey in Ashland, Kansas, as I aspired to follow him into the next category. It is an honor and privilege to be sharing his aircraft in Romania.



Aaron leading Mike in the Panzl.

Prior to 2014, I had resigned myself to the fact that the furthest I would achieve in competition would be flying Intermediate in the Super Decathlon. Flying the edge of the envelope encouraged energy management and the discipline to not push the airframe too hard. I still wear the Intermediate Stars Patch I earned in that machine. Then, Charlie Atterbury partnered

with a group of us to fly an Extra 300L. The Advanced category and Advanced Team became the goal. With this plane, many students and pilots gained experience and inspiration while exploring the wonder of Advanced and Unlimited style maneuvers. The support of my peers and this machine enabled me to achieve dreams I scarcely imagined. I can't thank Charlie enough.

As I prepare for Romania, training under Nikolay Timofeev with the team has been an honor. Stan Moye generously let me train with his Extra 300SHP while in Florida. Currently, I'm perfecting maneuvers in Aaron's Panzl. It is a beast. Aaron is geographically my closest teammate so we are working together to stay proficient in his machine and work logistics to transport it to Europe.

I've been entertained analyzing the aerodynamics and control harmony between the Extra 300L, Extra

300SHP, Extra 330LX, and Panzl S330. Perhaps another time it could make an interesting presentation.

For now, I'm grateful for the constant support and sacrifices my wife and sons make while I train to do my part for Team USA! They have been my inspiration and support since I began my aerobatic journey. There's nothing like hearing your son over the radio, asking if you can draw an "89" in the sky with smoke. It scored well with the judges who matter.

In my battle plan for Romania, I anticipate drawing the No. 1 flight slot, and will be ready to give my team the gouge. By putting this in writing, maybe I'll have a little more luck. With the training and support of our teammates and flying for the Stars and Stripes, luck won't be needed.

As the U.S. Advanced Team prepares for Romania, we are one team with one goal! **IAC**

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