

SPORT

MARCH 2020

Aerobatics

OFFICIAL MAGAZINE OF THE INTERNATIONAL AEROBATIC CLUB



- ▶ 2019 TEXAS SERIES WRAP-UP
- ▶ ZLIN CZECH OUT

UNLIMITED

FUN



Partner
Recognition
Vehicle Pricing



ALL-ELECTRIC. ALL-ADRENALINE.
THE **FORD MUSTANG MACH-E**



RESERVE NOW AT [FORD.COM](https://ford.com)

Reservation terms and conditions apply. Pre-production vehicle images simulated.
Production models may differ. Mustang Mach-E GT edition model shown coming early 2021.

BUILT *Ford* PROUD



CONTENTS



FEATURES

- ▶
8
Unlimited Aerobats Cleared Into the Box
The GameBird GB1
by Lorrie Penner
- 14
2019 Texas Series Wrap-Up
by Doug Jenkins
- 22
Czech Out: Flying the Grand Dame of Modern Aerobatic Competition
The Zlin 526F Trainer
by Phillip Gragg
- 26
The Origins of Aerobatic Competition Monoplanes
IAC 50th anniversary spotlight
by Tom Myers



DEPARTMENTS

- 2
PRESIDENT'S PAGE
by Robert Armstrong
- 3
EDITOR'S LOG
by Lorrie Penner
- 4
LINES & ANGLES
- 28
HUMAN FACTORS
by Fred G. Delacerda
- 32
FLYMART

COVER

ON THE COVER: GameBird GB1 flies inverted.
 Photo courtesy of GameBird.

ABOVE: Designer Philipp Steinbach trails behind 2013 World Aerobatic Champion François Le Vot.
 Photo by Christina Basken.

Publisher: Robert Armstrong, president@iac.org
Executive Director: Stephen Kurtzahn, execdir@iac.org, 920-479-0597
Editor: Lorrie Penner, editor@iac.org
Contributing Authors: Robert Armstrong, Benjamin Bagby, Fred DeLacerda, Viebke Gaard, Phillip Gragg, Doug Jenkins, Lorrie Penner, Tom Myers
Senior Copy Editor: Colleen Walsh
Copy Editor: Bryant Shiu
Proofreader: Meghan Plummer
Graphic Designer: Cordell Walker

IAC CORRESPONDENCE

International Aerobatic Club, P.O. Box 3086
 Oshkosh, WI 54903-3086
 Tel: 920-426-6574 • Fax: 920-426-6579
 Email: execdir@iac.org

ADVERTISING

Advertising Manager: Sue Anderson, sanderson@eaa.org

MAILING

Change of address, lost or damaged magazines, back issues.
 EAA-IAC Membership Services
 Tel: 800-843-3612 • Fax: 920-426-6761
 Email: membership@eaa.org

EAA® and SPORT AVIATION®, the EAA Logo® and Aeronautica™ are registered trademarks and service marks of the Experimental Aircraft Association, Inc. The use of these trademarks and service marks without the permission of the Experimental Aircraft Association, Inc. is strictly prohibited. Copyright © 2020 by the International Aerobatic Club, Inc. All rights reserved.

The International Aerobatic Club, Inc. is a division of EAA and of the NAA.

A STATEMENT OF POLICY The International Aerobatic Club, Inc. cannot assume responsibility for the accuracy of the material presented by the authors of the articles in the magazine. The pages of Sport Aerobatics are offered as a clearing house of information and a forum for the exchange of opinions and ideas. The individual reader must evaluate this material for himself and use it as he sees fit. Every effort is made to present materials of wide interest that will be of help to the majority. Likewise we cannot guarantee nor endorse any product offered through our advertising. We invite constructive criticism and welcome any report of inferior merchandise obtained through our advertising so that corrective measures can be taken. Sport Aerobatics (USPS 953-560) is owned by the International Aerobatic Club, Inc., and is published monthly at EAA Aviation Center, Editorial Department, P.O. Box 3086, 3000 Poberezný Rd., Oshkosh, WI 54903-3086. Periodical Postage is paid at Oshkosh Post Office, Oshkosh, Wisconsin 54901 and other post offices. Membership rate for the International Aerobatic Club, Inc. is \$45.00 per 12-month period of which \$18.00 is for the subscription to Sport Aerobatics. Manuscripts submitted for publication become the property of the International Aerobatic Club, Inc. Photographs will be returned upon request of the author. High-resolution images are requested to assure the best quality reproduction. POSTMASTER: Send address changes to Sport Aerobatics, P.O. Box 3086, Oshkosh, WI 54903-3086. CPC 40612608

Member Feedback — The Bad and the Good

BY ROBERT ARMSTRONG, IAC 6712



GREETINGS, IAC MEMBERS!

I am not one to follow folklore, but that little rodent in Punxsutawney that holds some magical power over the end of winter weather based on a shadow has predicted a milder weather pattern leading to an early spring. I do hope it is true.

In every column, I have requested input from members. I am happy to report that I am getting emails with encouraging information along with some emails from members who think the information they share will not make me happy. It is quite the contrary. Sometimes the bad news is the information you need to properly diagnose the problem. Once the issue is known, then a course correction can be implemented. Don't stop communicating with me. Good or bad, complimentary or critical, I appreciate it all.

In news of the positive, I have been informed that an IAC member is practicing the 2020 Sportsman sequence in his clipped wing Cub with no inverted systems. The report is that it is a challenge but can be done! This is a welcome indication that our sequence chair and his committee have done an excellent job in the first year designing and testing a sequence that can be flown in an airplane meant for beginning aerobatics. It has been years since the Sportsman program has met that goal. Way to go! Progress is getting more of those airplanes back into the air at local competitions.

On to the "dislike" subject. After becoming the vice president, I had input from some members telling me how they had been given the cold shoulder by IAC members when they either visited a chapter event or attended a contest to volunteer. It's difficult to say why any IAC members would behave this way, and it's even harder to imagine that you have to tell adults how to behave at all. Please remember the welcome we received when we first walked into an IAC meeting, a play day, or a contest, and return the good feeling to all who explore our hobby.

Now back to some discussion on a subject mentioned previously — base aircraft and category creep. Referencing the member who reports the progress in a clipped Cub, we may be seeing some welcome un-creeping! I have a large collection of *Sport Aerobatics* that I have used for reference, and I have looked for the sequence differences between today's competitor and one from more than 20 years ago. In particular, I was looking back on the Unlimited category where I competed from 1990. From the inception of or shortly after the first IAC/Aerobatic Club of America events were organized, the Unlimited flown at IAC contests were created by CIVA, occasionally modified for safety reasons. The various changes in the format of Free programs and allowed Unknown figures were sometimes lagging by a year. This delay was seen as a hindrance to our Unlimited team, and the result was a more direct following of the changes from CIVA.

My first world contest was a weather bust. The format up until then required 14 days to conduct a contest with almost 100 pilots participating. This occurrence started a shift of format with the plan to shorten the duration of the contest and many other changes. The most obvious

change was the reduction in the number of maneuvers in the Free program. Other changes occurred that I feel had been driven by various CIVA members looking to improve the probability of winning. An example from many years ago was the "reduced maneuver bonus points" in Free programs. It did not produce the results the proposing party hoped for, so it was abandoned, but not before the number of figures for a Free program was reduced to nine.

A more recent example of what I see as negative progress is the introduction of allowing the addition of a snap roll on the first leg of a tailslide. This type of change appears when a limited number of pilots compete among themselves without desire for the sport to introduce new members.

So, where does this go? In my opinion, we have lost the members who were flying Unlimited and now Advanced as a hobby sport. We have stopped using the CIVA format to run contests, but what is missing is any correction to the changes prior to then.

When so few regional contests are able to field a full category of Unlimited pilots, it is painful to say we have pushed away the pilots who have and will fly for fun in Unlimited. If we can just regress to a date where less is required of the machine and the pilot, I feel we may recover from some of the shrinking that has occurred. It will not happen over a single season, but if nothing is done, we do not have many seasons to look forward to.

As always, for any of this to happen I need members' support. That means members' ideas and suggestions. That means letting all of the directors know you would like your children and grandchildren to be able to attend the IAC 100-year celebration in 2070. **IAC!**

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



Classic and Modern Aircraft in Our Aerobatic Community

BY LORRIE PENNER, IAC 431036

AT ONE OF MY LAST BOARD MEETINGS as executive director, I was talking to Robert Armstrong about various aerobatic airplanes. He wondered what had happened with the Stephens Akro. I had to admit that I knew nothing about the plane, which sent me on a quest to find out more.

As a result of my research, this month we are reprinting an article originally written by Tom Myers and published in the January 1994 issue of *Sport Aerobatics*.

Coincidentally, I had a delightful communication with Ron Sutton, EAA 29083, who sent me his first logbook dated 1969-1973. In it are the signatures of great aerobatic pilots who flew out of Flabob Airport in the 1960s-1970s, among them Clayton Stephens, Margaret Ritchie, and Art Scholl. Special *In the Loop* content on the Stephens Akro from Ron can be found posted to our webpages at www.iac.org/articles.

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

From Tom's article I saw that Clayton and Margaret's husband, George, had worked together to design the first prototype of the Stephens Akro for Margaret to fly in the 1967 U.S. National Aerobatic Championships with the purpose of beating the Pitts Special, which was starting to dominate the competition at that time.

Prior to taking possession of the prototype, Margaret had been flying and winning competitions in a 150-hp clipped wing Taylorcraft, and Art Scholl had been flying a clipped wing Cub. Ready to change to a mount with more power, Margaret originally had obtained a 260-hp Super Chipmunk from Canada. You will see from the article that she ended up selling it to Art, who would continue his successful aerobatic career in that airplane.

Although I have known that the aerobatic community is tight like a family since I became involved in aerobatics, it still amazes me how interwoven the people and airplanes are within this community.

While thinking about airplanes, I went back to look at an article that was written last year by Phillip Gragg about his experience flying a Zlin in the Czech Republic in June 2019. I had held the article because we published another article about George Kalbfleisch's Zlin for the July issue at the same time Phillip's article was received. Phillip's article is a true pilot report and extremely helpful to

anyone considering flying the grandfather of modern aerobatic competition.

Staying with the aircraft theme, another article that appears in this month's issue is about the GBI GameBird. I had originally worked with Philipp Steinbach during EAA AirVenture Oshkosh to capture air-to-air photos of the newly approved two-seat version, which received its FAA production certificate in June 2019. A follow-up article was scheduled for the next issue of the magazine, but a version of "the dog ate my homework" situation arose and I had to re-interview Philipp.

Enjoy these examples of classic and modern aircraft in our aerobatic community.

In the January issues of *Sport Aerobatics* and *In the Loop*, I mentioned that we will be putting together a 50th anniversary poster for AirVenture. We can fit 260 photos of our IAC members' airplanes on the 25-by-38-inch poster. To date, I have collected nearly half of the needed photos. I have to send the final layout of the poster to the print shop by April 3. So, don't wait — send me your photos by March 27. Space is running out and time is precious.

Email your original static or aerial photos to editor@iac.org. Photos should be at least 1 MB or 300 dpi to ensure a good quality print. Your name, city, and state with airplane type should accompany the photo. **IAC!**

▶ TOP STORY

2019 Collegiate Program Final Standings

JORDAN ASHLEY, IAC Collegiate Program Chair, offers his congratulations to the winners of the 2019 Collegiate Championships. The collegiate eagle trophies will be presented to the recipients at the IAC Member Gathering in Oshkosh, Wisconsin, at EAA AirVenture Oshkosh on Friday, July 24, 2020. The results of the championships have been verified and are as follows:

TEAM CHAMPIONSHIPS

1st: Metropolitan State University of Denver — MSU Denver reclaimed first place from the University of North Dakota (UND) with a total score of 6,571.92 out of 7,650 possible points/85.91%.

2nd: UND — with a total score of 5,818.65 out of 7,050 possible points/82.53%.

3rd: U.S. Air Force Academy — with a total score of 5,265.24 out of 6,600 possible points/79.78%.



MSU Denver Aerobatic and Glider Team.



MSU Collegiate Team members at the U.S. National Aerobatic Competition swept the awards in Primary. Right to left are Jose Leonardo Garzon Gonzales, Roger Austin Belleau, and Landon Diedrich.



University of North Dakota Aerobatic Team.

INDIVIDUAL CHAMPIONS

1st: Benjamin Bagby from the University of Arkansas, Fort Smith — 7,587.88 out of 9,030 possible points/84.03%. It was Ben's first year competing in the Collegiate Series.

2nd: Vibeke Gaard — MSU Denver — 7,415.82 out of 9,030 possible points/82.12%. Vibeke competed in 2017, and she finished sixth in 2018.

3rd: Alex Hunt — UND — 8,395.52 out of 10,320 possible points/81.35%. Alex competed in 2017, and he finished fourth in 2018.

The collegiate competition program is intended to increase flying safety and encourage interest in aerobatics among college-age students. It is the intent of this program to sharpen pilot skills in the categories where they can be the most rewarded in terms of pilot ability and collegiate recognition. The program is also intended to be a springboard for competitors to continue their pursuit of aerobatics upon leaving the collegiate environment.

The two awards serve to recognize skill and proficiency for the collegiate aerobatic competitor. The Collegiate National Championship Team Award recognizes the highest-scoring U.S. Collegiate Team. The Individual Collegiate National Champion Award recognizes the top three individual collegiate competitors in the Sportsman or higher category. To qualify, a competitor must be a full-time undergraduate student in an accredited college or vocational program. Teams may be formed by three or more competitors from the same school, one of which must fly in the Sportsman category.

More information on the program can be found on the IAC Collegiate Program webpage.

2019 Collegiate Program First-Place Winner

BY BEN BAGBY, IAC 438926

I BEGAN FLYING AEROBATICS at the age of 19 after receiving my private pilot certificate. My first aerobatic ride was with a local pilot in the back seat of his RV-4. After some aileron rolls, loops, and an Immelmann, I was instantly hooked and figured that learning aerobatics would be much more fun than beginning work on the instrument rating.

My father, a former F-16 pilot and now a captain at American Airlines, began teaching me aerobatics in a Super Decathlon. We started with the basics: spins, aileron rolls, loops, half-Cubans, hammerheads, and slow rolls. Just flying the figures on their own was more fun than I could have imagined, but then we came across the International Aerobatic Club. The challenge of stringing the figures together into sequences and flying for scores in front of judges was enticing, and I knew that it was something I wanted to push toward doing.

Jumping into flying contests didn't happen immediately. In fact, it took over a year from when I first learned about the contests to the first time I flew. During my first season of flying contests in 2017, I was able to make two, Lonestar and Highplanes Hotpoxia, and met some great people along the way. As the new guy, I was a little bit lost, but everyone was extremely helpful and friendly.

Between the 2017 and 2018 seasons, I transitioned out of the Super Decathlon and into a Pitts S-1T. Consequently, I only flew one contest during the 2018 season after realizing that the Pitts was a different animal than the Super D, and it was going to take many hours of practice to learn the airplane. To aid in the need for practice, the KRKR airport was kind enough to allow me to set up an aerobatic practice area (APA) over the field.

Having the APA allowed for more productive flying as it cut out the flight time to and from the practice area and also allowed for easier critique. I was also fortunate that around this time a good friend of mine invited me to start attending practice camps with him. Being critiqued by a coach was immensely helpful, and the practice camps were, and still are, always a great time. The camaraderie and memories made are priceless.



 **BUTLER**
Butler Parachute Systems, Inc.

HIGH SPEED - CUSTOM FIT

888-235-3280
sales@butlerparachutes.com
www.butlerparachutes.com

Over the 2019 season, I was able to fly four contests: The Ben Lowell, The Midwest Aerobatic Championship, Highplanes Hotpoxia, and Nationals. Going to contests in different parts of the country is always cool; it's great to meet people from other chapters and hang out with other people who enjoy flying aerobatics. One of my favorite things about this sport is how tight the community is. While flying the contest is always fun, I always look forward to catching up with friends.

One of the coolest things about the collegiate program is hanging out and flying with the people from the Metropolitan State University of Denver and University of North Dakota. The coaches of these teams, Dagmar Kress and Mike Lents, go above and beyond. Dagmar goes out and safety pilots, no telling how many flights per day, and Mike safety pilots and kills it in Intermediate in UND's Super D. It's great to hang out and talk with the other collegiate kids about what we want to do in the aviation industry and watch where we all will end up in the years to come.

After attending a larger number of contests this year, one thing that I definitely noticed was the amount of work that it takes to put a contest on. It's really unbelievable. Thank you to the contest directors and volunteers who spend tons of time preparing for the contests and making sure everything runs smoothly. Without these folks, we wouldn't have any contests to fly.

There's so much to learn in this sport; it's definitely a journey and a continuous learning experience, but that's part of what makes it so appealing. I'm looking forward to the upcoming contest season, and I'm sure that everyone else feels the same way.



MSU DENVER AEROBATIC CLUB PRESIDENT GRADUATES

BY VIBEKE GAARD, IAC 438348

LOOKING BACK OVER THE LAST FOUR SEASONS, I have been fortunate enough to have logged 32.9 hours of competition flying in the box. Traveling to competitions from the East Coast to the West Coast, I have had the pleasure of meeting some fantastic people in the IAC community.

It all started at the beginning of my second year at the Metropolitan State University of Denver (MSU). I still remember the text from Dagmar Kress in early spring of 2016; it would change my passion for flying forever. It took a few weeks, but along with five other students, we founded the MSU Denver Aerobatic and Glider Club. Another few weeks passed before I had my first aerobatic flight with Dagmar in her Pitts S-2C. I can tell you that the view from the front seat of the Pitts was totally different from the straight and level flying I had been doing in my Cessna 182T. I entered my first competition after only three practice flights. It was the Highplanes Hotpoxia contest in Fort Morgan, Colorado, hosted by our local IAC Chapter 12. Coach Dagmar always warned us that as soon as the chief judge would clear us into the box, "Your brain will leave your head and hide under your seat cushion." It sure did, for all three of my competitions that year. As the 2016 competition season came to an end, our new MSU team placed second after University of North Dakota.

As the president and founding member of the MSU Denver Aerobatic Club, I was delighted that our team in 2017 was able to double in size from the year before, with the addition of coach Nick Slabakov and his Extreme Decathlon, the support of Chapter 12, and Women's World Aerobatic Champion Betty Stewart, who volunteered her time for critiques. Our new members were dedicated to the team and practice. Our competition season started in April with the Ben Lowell Aerial Confrontation at the U.S. Air Force Academy in Colorado Springs (elevation 6,576 MSL). When it finally stopped snowing, I was the first one to dive into the box at 12,000 MSL. My last competition in 2017 was the Tequila Cup in Marana, Arizona. It was my seventh competition that year, and I finally won first place in primary. In 2017, The MSU Denver Aerobatic and Glider Club also placed first in the Collegiate Series, and this win finally gave us credibility with the university and the aviation department. Our club was finally recognized as an official team at MSU.

In 2018, I was fortunate to travel to eight contests, the first three in Primary and the rest in Sportsman. The first competition was the Snowbird Classic in Dunnellon, Florida, where Natalya Shemigon and I flew with Charlie Sikes and Marty Flournoy in their Pitts S-2A.

My first Sportsman competition was in Sterling, Colorado. I had insisted on a Free sequence, and last minute due to some airplane issues I got to fly my second and last flight with Luke Penner in his Extra. This occasion was my first flight in an Extra; I hard-zeroed every figure, but it was the most fun flight I had all season.

I needed a few more flights in an Extra, so I traveled to the CanAm Championship in Montana and flew with Jerry Riedinger in his Extra. That was a nice little competition, but we had to cut it short by a day due to smoke from the fires, which made visibility an issue. My last competition was the Nationals at Wittman Regional Airport in Oshkosh. Overall, my decision to have a Free sequence and limited time to practice both the Known and the Free did not work out as I seemed to forget one figure in the Free and ended up flying the second half backward. The MSU team placed second, but we had some team members that were well practiced and would fly the next season.

My final season flying on the collegiate team for MSU Denver was in 2019. I wanted to try to fly as much as possible, and I participated in nine competitions. I started out again at the Snowbird in Dunnellon and then made a few trips to California to fly with Dave Watson. I had five competitions with Dagmar in her Pitts, including traveling back to Nationals, this time in Salina, Kansas. At my last competition, I was invited to fly with Duncan Koerbel in his Extra at the competition in Jean, Nevada.

Winning was not my primary focus when founding and flying with the MSU Aerobatic Team. I believe all aviation schools should expose their students to aerobatic flying in a safe environment as this approach makes better pilots. Placing second for the individual collegiate program is a byproduct of flying as many competitions as I did, and I am proud of being here with Ben and Alex, two very good pilots.

As I have now graduated, my time flying with the MSU Denver team is over. I wish them all good luck and safe flying. It's been a pleasure having the opportunity to found and make a team sustainable. I am hoping in the future I will be able to be administratively involved in the IAC Collegiate Series program.

It's been an amazing four years, looping through the skies. I want to thank Dagmar for getting me involved. Also, a big thanks to everyone who has coached me, the new friends I made on the judging line, and all the safety pilots who were hanging on for dear life when I was flying. **IAC!**



FLY-IN • TRADESHOW • CAREER FAIR • WORKSHOPS • AIRSHOW

SUN n FUN

AEROSPACE EXPO

Lakeland, Florida

KLAL

EXPERIENCE

STOL

IN

2020

#SnF20

March 31
to April 5

Proceeds Support:

AEROSPACE
Center For Excellence

Check daily schedules for featured **STOL Competitions** during the week!

Ticket upgrades &
event info at flaysnf.org

FlyLakeland
Lakeland Linder
International Airport

Visit
Central Florida



PHOTOGRAPHY BY ED HICKS

UNLIMITED AEROBAT CLEARED INTO THE BOX

The GameBird GB1

BY LORRIE PENNER, IAC 431036

WHEN YOU WATCH PHILIPP STEINBACH fly the GB1 GameBird, your initial thought might be, “Am I watching a full-scale RC airplane?” The maneuvers seem to defy standard monoplane performance. Seasoned aerobatic pilots stop in their tracks and ooh and aah with the rest of the spectators.

Last September, Philipp flew to the U.S. National Aerobatic Championships from his Bentonville, Arkansas, factory to act as warm-up pilot for the Unlimited category’s Unknown sequence. All sat spellbound as he went through the program and added a flare at the end, floating, tumbling, and hovering over the Salina airport. “The GameBird is meant for having fun, whether you want to fly Unlimited aerobatics, travel cross-country, or just tool around,” Philipp said. “It’s not a one-trick pony. A lightweight airplane with a big Lycoming IO-580, 303-hp engine may not be a new concept, but there’s nothing else on the market executed at this level that does so many things so well.”

Starting Game Composites with Stuart Walton in 2013, Philipp and his small team carved out a plan and went to work, starting in a rented office container on a small airfield in the United Kingdom. “We started with all the nonshiny things, like processes and organization structure,” he said. “From there, we made a job description for the airplane and started the design and certification work, including the tooling design and work instructions for production.” All in all, the airplane design was about 20 percent of the overall work to get the airplane to market. The remaining 80 percent of work went into the typical startup company challenges, plus everything the aviation regulators require for any airplane company nowadays. Regardless if it makes airliners or aerobatic airplanes, we completed bench/ground tests, flight tests, compliance demonstration, and production drawings.



The first production GameBird was completed in November 2018. The FAA production certificate was awarded in June 2019, and since then 15 more GameBirds have taken flight. The company has grown from a team of four in 2016 to a workforce of 40, building one plane every three weeks. The construction time from start to finish is currently 42 days. “Everybody was trained from scratch,” Philipp said of the local workforce. “Most of the guys are young and straight from school. For them, it’s a real career opportunity.” He said hiring locals and teaching them the fine points of building certified composite airplanes to the satisfaction of FAA inspectors has been a challenging experience with meaningful rewards. There are few composites technicians in the United States trained to the exacting standards necessary for this work. By hiring locally, Game Composites both invests in the community and ensures that skilled workers learn to execute their craft at the highest possible caliber.

The GB1 is Philipp’s third aircraft design. His first, starting in 1997, was the Impulse 100. In 2003 he started design work on the single- and tandem-seat versions of the XtremeAir Sbach. The composite structure low-wing monoplane earned him one of IAC’s prestigious annual awards, the Curtis Pitts Memorial Trophy in 2013, which recognizes outstanding contributions to aerobatics through product design.

The GameBird is based on a wish list from Philipp’s own experiences of flying, competing, and teaching people aerobatics in various airplanes.

It has incredible aerobatic capabilities with slow-speed maneuvers that remind you of an RC airplane. Each wing-half weighs only 80 pounds and each aileron 9 pounds, so the roll inertia is very low. The spadeless aileron design features positive centering and helps to precisely control the roll rate of up to 450 degrees per second at 235 knots. With less than 20 hours in the type, Patrick Davidson flew his GameBird to a respectable second place in Unlimited at the July 2019 South African National Aerobatic Championships.



"THE GAMEBIRD IS MEANT FOR HAVING FUN, WHETHER YOU WANT TO FLY UNLIMITED AEROBATICS, TRAVEL CROSS-COUNTRY, OR JUST TOOL AROUND."

– PHILIPP STEINBACH

The GameBird adds unprecedented speed and range to this class of airplane, which opens the market beyond the aerobatic box and makes getting there and back a lot more enjoyable. The aerobatic tank in the fuselage provides 25 gallons for aerobatic flight. With another 56 gallons split between two wing tanks, this capacity adds up to 81 usable gallons. A flight last November demonstrated the cross-country versatility of the GameBird: Philipp ferried a GB1 1,100 miles nonstop from a customer in Idaho back to Bentonville, arriving home with 50 minutes of endurance remaining.

Philipp and the Bentonville team have made a few improvements since the 2016 flight test program. The new Garmin G3X avionics suite provides radio and transponder access, navigation, engine and fuel management, live weather and airport information, and ADS-B In and Out for both seats. This avionics package combined with full dual-engine controls makes the GameBird a real two-seater with an unprecedented level of safety and situational awareness among aerobatic airplanes.

Future customers can thank the Halcones for the factory camera mounts. The Chilean air force aerobatic demonstration team, which is trading in its seven Extra 300Ls for GB1s, needed certified action camera mounts. Philipp said these military customers "can't just go buy GoPro mounts and stick them on airplanes," so the hardware had to be tested and incorporated into the type certificate. In the process, they became an option for future customers.

The 2020 list price of \$425,000 rolls all of those wish list items into one incomparable aircraft. The purchase price even includes 10 hours of ground and flight training to make sure new owners enjoy letting their GameBird live up to its name.

Customers can add a G3X display in the front cockpit, built-in camera mounts, a custom paint scheme, and a sleek single-seat canopy. Current lead time is about eight months.



The cockpit of the GB1 is stylish, modern, and ergonomically optimized. It has enough space to accommodate pilots from 5 feet (150 centimeters) to 6 feet, 6 inches (202 centimeters).

Harvey & Rihn Aviation

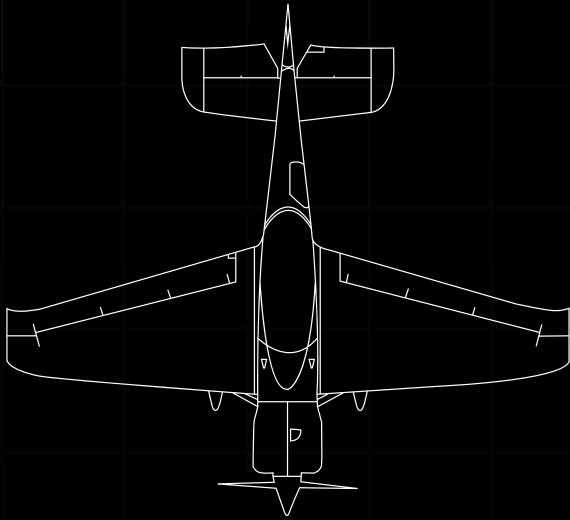
WORLD CLASS TRAINING AND MAINTENANCE

AEROBATIC TRAINING
Basic through Unlimited
Competition & Sport
Safety & Proficiency
Basic & Advanced Spins

MAINTENANCE FACILITY
Specializing in fabric, tailwheel
and aerobatic aircraft repair.

AIRCRAFT
Pitts S-2B ★ Super Decathlon ★ Decathlon

Debby Rihn-Harvey - Owner
281-471-1675
101 Airport Blvd., Laporte, TX 77571
www.harveyrihn.com



SPECS

GB1 GAMEBIRD

LENGTH:	22 feet, 7 inches
WINGSPAN:	25 feet, 4 inches
EMPTY WEIGHT:	1,390 pounds
GROSS WEIGHT:	1,940/2,200 pounds
SEATS:	2
POWERPLANT:	Lycoming AE10-580 B1A, 6 cylinders
HORSEPOWER:	303 @ 2600 rpm
PROPELLER:	MTV14-190-130-1 four-bladed
FUEL CAPACITY:	81 gallons
CRUISE SPEED (75% POWER):	230 mph
RANGE:	1,000 nm

THE GAMEBIRD IS BASED ON A WISH LIST FROM PHILIPP'S OWN EXPERIENCES OF FLYING, COMPETING, AND TEACHING PEOPLE AEROBATICS IN VARIOUS AIRPLANES.

Philipp said earning the FAA and E-ASA type certificates for the airplane and finally the production certificate is a satisfying reward for many, many late nights and early mornings. "Bringing a new airplane to market is an all-out effort," he said. "I'm very proud of what our small team has achieved in a comparably short period of time." With all necessary certificates on the wall and a solid order book, Game Composites will focus on getting the production rate up to two airplanes per month, building up the service network to support customer airplanes.

Philipp said he is looking forward to flying more again. "Doing that warmup flight at the Nationals was fun, but competing again would be great! I just need to find time." He is committed to growing the sport of aerobatic flying while raising the level of proficiency and safety of pilots. To do so, Game Composites is organizing a series of training camps throughout the United States to give pilots the opportunity to receive world-class aerobatic coaching in collaboration with local IAC chapters.

Aerobatic pilots of all levels are invited to bring their airplanes to any of the Game Composites Aerobatic Training Camps and join Philipp and the Game Composites team for a weekend of coaching. The GB1 GameBird will be on hand and available for viewing and demonstration rides. "Game isn't just about producing airplanes," Philipp said. "It is here to be an active, contributing member of the community and help grow this great sport."

The first camp will be held in Miami Executive Airport (KTMB) from April 6 through April 8 after SUN 'n FUN Aerospace Expo. The second camp will be held at Mesa Del Rey Airport (KKIC) from April 24 through April 26. Sign up at www.GameComposites.com and experience for yourself just how playful the GameBird can be.



The GB1 GameBird will be displayed at several events this year, including SUN 'n FUN in Lakeland, Florida, the Reno Air Races in Stead, Nevada, and EAA AirVenture Oshkosh. You can find Game Composites at AirVenture parked in front of the IAC Vicki Cruse Memorial Pavilion, where company staffers have enjoyed mingling with the IAC members and aerobatic enthusiasts for the last three years. **IAC+**



ABOVE: Snuggled between the iconic green and black, the red and white CO Fire Aviation Inc. Gamebird GB1 is employed in the company's upset recovery training program.



ABOVE: Five-time South African aerobatics champion Patrick Davidson of South Africa took delivery of his Gamebird GB1 in 2019.



RIGHT: Owner/Designer Philipp Steinbach flies inverted over Beaver Lake less than 20 miles from the Bentonville, Arkansas, factory where the GB1 is produced.



2019 TEXAS SERIES WRAP-UP

BY DOUG JENKINS, IAC 436255

The Texas Championship has finished another season! As a refresher, the Texas Series is designed to increase participation at all three Texas contests by awarding super-cool trophies and airplane stickers to first- and second-place finishers and airplane stickers to third-place finishers in all categories. The series pilots must participate in the same category at all three Texas contests to be eligible, and a simple average of the three scores will determine the champions. Series contests include the Early Bird, held in Edna; the Lone Star, held in Breckenridge; and the Hammerfest, held in Llano.

After securing at least a vague promise of financial backing from all three IAC Texas chapters (24, 25, and 107), I committed to the series, which launched its maiden flights in 2018.

The first leg of the series began with the Early Bird hosted by IAC Chapter 25 at the Jackson County Airport. Flying and nonflying volunteers instrumental in running the contest were Janet Fitzke, registrar/scoring; Gary Walker and Denny Beacham, starters; Debby Rihn-Harvey, chief judge; Jeff Poehlmann, Bryan Butler, Tom Adams, and Chrissy Jenkins, judges; and Tony Davila, contest director. Special thanks to airport managers and hosts Rick and Kim McClure of Rickim Aviation.

This first contest of the series attracted 10 Sportsman pilots. The winner, Todd Nelson, was the clear winner with the next two finishers, David Valaer and Patric Coggin, battling it out for second and third with only 0.4 percent points separating them.



ANTICIPATION

Planes lined up at the Texas Hill Country Hammerfest held in Llano, Texas.







Intermediate pilot Doug “Bags” Jenkins (me) came out on top with Erik “SNAP” McDaniel giving me a run for my money. King of the hill in Advanced was Klayton Kirkland, who would go on to qualify for the U.S. Advanced Aerobatic Team at Nationals in September 2019.

Reflecting on the results from the Early Bird, I came to the following conclusions:

- Lesson No. 1: Biplanes rule, literally. All three categories were won by biplanes. Sporty and Intermediate were open-cockpit biplanes, no less! A Hyperbiplane also finished second in Sporty. Just sayin’.
- Lesson No. 2 (see lesson No. 1): “Legacy” airplanes can compete. Luck and guile can overcome brute horsepower.
- Lesson No. 3: RVs can successfully and safely compete, even in Intermediate! Patric Coggin’s RV-4 Free sequence even has an inverted spin ... in Sporty. Chew on that for a while.
- Lesson No. 4: Much like last season, every category is competitive.

The second leg of the series was the Lone Star Aerobatic Championship hosted by IAC Chapter 24 at the Stephens County Airport. As a pilot, I again want to take a few minutes up front to thank the nonflying volunteers without whom the contest would not have happened ... except there were way too many to name, so I would just leave someone out and hurt their feelings. Suffice it to say that the chapter and its members were all-in on this event in its new venue. If you want to see an example of the accommodations they used and where the awards banquet was held, check out the T-Bone Ranch in Ranger, Texas. Jaw-dropping!

On second thought, I will hit some of the highlights because they were way over and above. Contest Director Tony Wood and his wife, Julia, found out a week before the contest that the tried and true hotel had changed ownership and the accommodations no longer met standards. They proceeded to contact everyone attending and recommended alternate accommodations.

Lynda Judy and Jenn McDaniel for registrar/scoring; Chief Judge Pat Clark; and judges Chrissy Jenkins, Bill Denton, and Jerry Esquenazi made great contributions. By the way, these judges judged every flight! There was no turning of the line. They judged every pilot and category – a Herculean effort.

There were seven pilots in Sportsman at this contest, and there was little change in relative standings for the series. Todd Nelson, David Valaer, and Patric Coggin all retained their first-, second-, and third-place standings. As for Intermediate, well, Erik and I changed places, and Ron Schreck moved up into third. There were no Advanced competitors at this contest, so no Advanced Texas Series Champion this year.

Contemplating the results of this contest, I reflected and jotted down the following:

- Lesson No. 1: A well-flown Skybolt is a formidable adversary (Todd Nelson).
- Lesson No. 2 (again): “Legacy” airplanes can compete. Luck, skill, and guile still can overcome brute horsepower.
- Lesson No. 3: You can’t win if you don’t play the game.
- Lesson No. 4: Intermediate is one Unknown “buffoonerous” moment away from glory or disaster.

Our Texas contest season, and therefore the 2019 Texas Championship Series, concluded with the ever-popular and much anticipated Hill Country Hammerfest. IAC Chapter 107 and the Llano airport pulled out all the stops this year. The weather was phenomenal, the fuel was cheap, the people were friendly, and the temperatures were less than roasting.

First, there are some people to thank at Hammerfest. Contest Director/Volunteer Coordinator Chrissy Jenkins kept the cats herded. Others who came solely in supporting positions to volunteer their time included judges Jeff and Lynne Stoltenberg, registrar and starter Joel Utz, judge Jeff Poehlmann, and volunteers Jaret Burgess and David Valaer. Too many spouses and family members to count showed up to help out and cheer on their favorite pilot to their best possible performance. Thanks to each and every one of you!

Finally, on to the results. If you were following along this season, you already know that there will be no Texas Series champion in Primary, Advanced, or Unlimited. Sportsman and Intermediate were where all the action took place.

2019 SPORTSMAN FINAL STANDINGS

PILOT	AIRPLANE	EARLY BIRD	LONE STAR	HAMMERFEST	OVERALL
Todd Nelson	Skybolt	84.76	81.80	81.96	82.84
Doug Greene	DR-107XL	61.71	73.16	79.58	71.48
DR Bales	Extra 200	76.13	76.09	47.83	66.68

2019 INTERMEDIATE FINAL STANDINGS

PILOT	AIRPLANE	EARLY BIRD	LONE STAR	HAMMERFEST	OVERALL
Doug “Bags” Jenkins	Pitts S-1E	80.78	77.11	82.73	80.21
Erick “SNAP” McDaniel	Extra 200	79.31	78.85	80.41	79.52

EXTRA
AEROBATIC AIRCRAFT

EXTRA NG

The Next Generation of Aerobatic Aircraft

Italian design meets German engineering. Featuring a sleek full-carbon rigid baseframe, superb performance, and a modern cockpit designed for the utmost in comfort.

Contact Doug Vayda
Email: dvayda@southeastaero.com
Tel: 904-568-9410

SOUTHEAST AERO
385 Hawkeye View Lane, St. Augustine, FL 32095
www.southeastaero.com



A hearty congratulations to all of these pilots. To invest the blood, sweat, and tears it takes to participate in this sport and to sustain that commitment across the season is an accomplishment in itself. A further congratulations to the “team” behind each pilot. We all have a spouse, family, friend, or mentor who got us to where we are. The pilots take home the hardware, but it’s a team sport. See you next season! **IAC**



PHOTOGRAPHY BY KEVIN BROWN, DOUG JENKINS



2020 IAC CONTEST SEASON CALENDAR



Find the full map online at drive.google.com/open?id=1TSdH3xkp4bLoF2dDhzHPuqq15UIxPrr&usp=sharing.

DATES	HOST CHAPTER	NAME	REGION	LOCATION	AIRPORT
Mar. 26, 2020	89	Snowbird Classic – IAC East Open	Southeast	Florida	X60
April 3, 2020	25	IAC 25 Early Bird Contest	South-Central	Texas	26R
April 17, 2020	36	Hammerhead Round Up	Southwest	California	Lo8
April 25, 2020	27	Tennessee Music Hwy Aerobatic Jam	Southeast	Tennessee	KMKL
May 1, 2020	23	Sebring 81	Southeast	Florida	IKSEF
May 1, 2020	49	Duel in the Desert	Southwest	California	KAPV
May 15, 2020	24	Lone Star Contest	South-Central	Texas	KBKD
May 16, 2020	58	Wildwoods Acrobast!	Northeast	New Jersey	KWWD
May 29, 2020	38	Coalinga G Fest	Southwest	California	C80
May 30, 2020	61	Giles Henderson Memorial Challenge	Mid-America	Illinois	KSLO
May 30, 2020	12	Ben Lowell Confrontation	South-Central	Colorado	KSTK



TO-DO LIST

BUY NOW & SAVE!

EAA.ORG/TICKETS

Bring the kids and grandkids...

everyone 18 and under is free!*

EAA AIRVENTURE
OSHKOSH
 2020



*Free admission for youth 18 and under has been generously supported in part by **BOEING**

Czech OUT



**FLYING THE GRAND DAME OF
MODERN AEROBATIC COMPETITION**

The Zlin 526F Trener — Part 1

BY PHILLIP GRAGG, IAC 431292

They say never fly your heroes. The premise of that statement is that your vaunted image of something and the reality of it could never possibly align in a satisfactory manner. But what if you approached your hero as a respected elder? With an open mind and a desire to learn? Our approach and state of mind matter. Perhaps there are two questions we should ask of every flight review: What is it like to fly today, and what was it like to fly in its heyday?

My goal to fly a 1960s-era Zlin had existed for some time. When I took my first aerobatic training in 2001, I studied and read everything about aerobatics I could get my hands on. Two of the greatest literary sources of information were Neil Williams' simply titled book *Aerobatics* and Annette Carson's tome — really the only book ever written about the history of aerobatics — *Flight Fantastic*. It was here that I first learned about the existence of the Lockheed aerobatic competition held in England from 1955 to 1965.



LADISLAV BEZAK

While the Lockheed aerobatic competition was thought of as the progenitor of modern aerobatic competition (or at least the 4-Minute Free part of the contest), the first World Aerobatic Championships took place in 1960 in then Bratislava, Czechoslovakia, present-day Slovakia. It was won by a Czech, Ladislav Bezak, flying a Czech Zlin 226A. Zlin Aircraft, derived of the 226, which would reign supreme in 1962, '64, and '68, with the new-style Zlin 50L and derivatives winning in 1978, '84, and '86, after which we would see the rise of the CAP, Sukhoi, and ultimately Extra. Interestingly, at the end of the 13th World Aerobatic Championships, team trophies were tied 4-4, USA-USSR, with Czechoslovakia close behind with three team wins. However, of the 13 World Aerobatic Champions, seven were Zlin drivers.

We are very lucky in the United States to have a wide variety of homebuilt, homegrown, and imported aerobatic airplanes. A young, determined, g-thirsty pilot can saddle up to aerobatic ownership for about the same price as the average new vehicle purchase, or \$37,577, and for about 15 times that you can own a brand-new best-of-the-best. There are many choices in between those two extremes: pure aerobatic mounts suitable for competition, sport aircraft with decent aerobatic credentials, single-seaters, two-seaters, biplanes, and monoplanes. Sadly, we do not see very many of these aircraft in the United States from Czech aircraft maker Zlin.

mt-propeller

The Winner's Propeller!



Super Decathlon

Photo: Jim Koepnik

Patty Wagstaff



Available for almost every aerobatic and experimental aircraft.

GB1 Gamecomposites

MT-Propeller USA, Inc., Florida

Phone: (386) 736-7762

Fax: (386) 736-7696

e-mail: info@mt-propellerusa.com

MT-Propeller

Headquarters Germany

Phone: +49-9429-94090

Fax: +49-9429-8432

e-mail: sales@mt-propeller.com

www.mt-propeller.com



In May and June 2019, I was privileged to find myself on a summer teaching assignment at Charles University Faculty of Law in Prague, Czech Republic (*Czechia*, as some are calling it, consisting of the two distinctive regions of Moravia and Bohemia). If ever I was going to find a way to fly the grandfather of modern aerobatic competition, this environment had to be the time and the place. After some searching on the internet, I located a flight school that had a selection of boring, garden-variety Cessnas and one beautiful-looking Zlin 326. (Full disclosure, for 10 years I have owned a C-172N that has been in my family for 41 years.) After a quick email later, I learned the Zlin served as a towplane for the school's glider operations and was located far to the south. However, the manager put me in touch with a pilot who had a Zlin 526F that I could fly. The owner, Petr Bezdek, and I hit it off immediately, attending the Pardubice Airshow together that weekend in his Twin Beech C45H. Petr was kind enough to let me co-pilot the aircraft between Prague and Pardubice, as well as during the air show, including a VIP flight for local officials and the capstone performance each day led by a three-section element consisting of B-25, Spitfire, P-51, Yak-11, Yak-3, and T-28. Aviation is alive and well in Czechia!

The next Sunday, back at the Letiště (airport) Prague Letňany, and after a wink at the beautiful Twin Beech C45H, it was time to turn my full attention to the Zlin. It should be said, although the pictures will testify, the Zlin is a long, sleek, purposeful-looking aircraft. It is part speedster and part military trainer, and has just the slightest DNA from a glider. It is small but stately and elegant at the same time. Its large, glass-covered, tandem cockpit evokes a sense of occasion, and despite being a taildragger, its long beam gives the suggestion of forward motion.

The airfoil is asymmetrical and has a decent amount of dihedral, but the wing is also attached to the fuselage at a relatively high angle of incidence. The long slender nose slopes away from the windshield, adding to quirkiness not found in most other aircraft. As a result of these factors, sustained level inverted flight requires a feeling of nose-high attitude. It's not just a feeling, indeed, when viewed from the ground; the airplane appears to be pointed "up" when flying a level inverted line. More on that later.

The wing is an absolute work of art. It is entirely of metal construction and has tightly spaced ribs and flush rivets. Quality of construction is exceptional. The skin is reinforced and screws are mounted flush, too. There is considerable labor evident in the build of the aircraft.



Petr Bezdek flies his Zlin 526F, which is the plane reviewed here by the author.

Many components are overbuilt because of the military trainer roll. The simple fact is that the Czechs know how to build stuff. If history is any teacher, the National Technical Museum in Prague is testament to this (www.NTM.cz/en). They have a rich history of building cars, motorcycles, and airplanes. Their bikes from the late 1800s show some of the finest nonautomated machining work I have ever seen on any mechanical device, and their cars, airplanes, and motorcycles show genuine creativity, novel approaches to engineering problems, and smart design. Real craftsmen stuff.

One mounts the aircraft in a conventional manner, and lowering into the cockpit is a straightforward affair, even with a chute on. It is here for the first time that the 526F's post-World War II design roots and some of its limitations start to become apparent. The cockpit is fairly small. If you've ever experienced any stick interference in a Champ or J-3, it is a similar experience. Total stick travel was an issue, but the height of the stick was, too. At full rear corner stick deflection, my hand would hit my leg. If the stick were a few inches taller, it would yield almost another inch of travel without interference.

Smaller pilots are better off. There are other ergonomic factors at play. Controls do not fall to hand naturally, and the cockpit is far too busy in this regard — probably good for an initial military trainer but no virtue to an aerobatic pilot. The emergency canopy release knob is just above the throttle such that one has to thread one's hand between it and the throttle. The throttle itself is a small cylindrical affair, but it is just large enough. It is more cumbersome to use than a ball, and it is not large enough to have the security of a thicker and longer cylinder-type throttle. The extra size in this regard decreases comfort without improving convenience or functionality. Throttle movement is smooth and satisfying, despite the wonky throttle nob. The one virtue the throttle knob has is it would be unmistakable for the mixture tuning control (not a true mixture control) or the canopy release, and this was probably the point — just barely enough extra material to complete the task, but nothing more. **IAC†**

Editor's Note: Join Phillip next month when he describes some basic aerobatic maneuvers in the Zlin.



Partner
Recognition
Vehicle Pricing



THE ELECTRICAL STORM THEY WARNED YOU ABOUT



Introducing the all-electric **Ford Mustang Mach-E**.
The spirit of Mustang, electrified.

RESERVE NOW AT [FORD.COM](https://www.ford.com)

Reservation terms and conditions apply. Pre-production vehicle images simulated.
Production models may differ. Mustang Mach-E Premium edition shown available late 2020.

BUILT *Ford* PROUD

The Origins of Aerobatic Competition Monoplanes

IAC 50th anniversary spotlight

BY TOM R. MYERS, IAC 16830

BACKGROUND

I KNOW THERE ARE MANY of you who have shared the following experience. The owner of the competition box shredder you're about to buy needs to suggest only once that you might enjoy a test flight before you hand over the check. After what seems like only a few minutes of figures but is in reality over 30 minutes of sequence, you somehow manage to force yourself to turn the airplane right-side up and land.

The test flight on the day I bought my 1971 Stephens Akro, N100SE, went something like that. In fact, my only disappointment that day was that I could not shake the hand of Mr. Stephens himself right then and there for making such a flight possible. One year later, at the Riverside Airport, I would enjoy the honor of that handshake. This article is the story of what I learned about the history of competition monoplanes during my quest for the handshake.

THE MISS SAN BERNADINO

The year was 1947, and James Kistler had built a mid-wing racing plane designed by Eddie Allenbaugh and Bill Statler named the *Miss San Bernadino*. Eddie was the well-known designer and builder of many other exotic and innovative racers, including the *Californian* and the prone-pilot pusher-prop *Gray Ghost*.

The *Miss San Bernadino* was flown by Eddie in the Cleveland Air Races and the Goodyear Air Races in 1946 and 1947, and by James in the Goodyear Air Races between 1949 and 1952.

The plane was then renamed and repainted as the *Scholl Special* and flown by Art Scholl in the Reno Air Races between 1946 and 1966. In retrospect, the look of the future is clearly evident in this aircraft.

THE STEPHENS AKRO

The year is 1966. Margaret Ritchie of Riverside, California, has won the U.S. National Aerobatic Championships (women's division) in her 150-hp clipped wing Taylorcraft. Art Scholl is flying aerobatics in his clipped wing Cub. The Pitts Special is starting to dominate competition.

Margaret and her husband, George, recognized that to be competitive in the future, Margaret would need either a Pitts or a plane capable of beating a Pitts. Margaret was determined to compete that season, so the Ritchies turned to their friends Eddie Allenbaugh and Clayton Stephens, who assured them that they could design and build a new plane for Margaret in time for the 1967 U.S. National Aerobatic Championships, and capable of beating a Pitts.



Margaret Ritchie in the prototype Stephens Akro at Flabob Airport in 1967. The plane was painted orange with black trim. Legend "Design and Layout by E.F. Allenbaugh" was painted on the rudder.

Clayton and George had worked together on 23 aircraft projects at that point. Clayton had retired from San Bernadino's Norton Air Force Base and was building airplanes in the back of the Stolp Starduster hangar at Flabob Airport near Riverside. Clayton and George had met flying Super Cruisers for the California CAP.

Eddie would design and feed his drawings to Clayton just ahead of Clayton's building progress. Eddie died of a heart condition halfway through the project. Clayton finished the design with the aid of his brother Lucien, an engineer. When construction of the plane was completed, Clayton had formal drawings of what was actually built made by a draftsman he knew at the Riverside Water Planning Board. Clayton named the plane the Stephens Akro.

The frame was 4130 chromoly steel tubing. The cockpit was 20 inches wide. The +12g/-11g wing was all wood with two spars, without sweepback, incidence, or dihedral, though the spar tops were flat and the spar bottoms were tapered for effective dihedral. The airfoil was the almost symmetric NACA 23012. Aileron counterbalance weights gave the wings and ailerons different harmonic frequencies to prevent flutter. The engine was a 180-hp Lycoming AEIO-360. The prop was a fixed-pitch Sensenich 7660. The empty weight was 830 pounds (705 pounds on the mains, 125 pounds on the tail). The covering was the thinnest Ceconite with nitrate dope and automobile paint. The color was orange with black trim. Avionics was a battery-powered radio.

The prototype Akro was completed in about six months for about \$10,000. As may be seen in Photo No. 2, the height of the canopy was designed to fit Margaret's hairdo without flattening it during outside maneuvers. A wall had been installed in the Stolp hangar during the construction of the Akro, so the back wall of the hangar had to be cut open to get the completed plane out.

The owner of Flabob Airport, Flavio Madariaga, was the pilot for the July 27, 1967, first flight. The first flight was actually supposed to be a high-speed taxi test, but the plane lifted off so quickly that Flavio just continued to climb.



Clayton Stephens, left, and George Ritchie with the prototype Akro at Reno in 1967.

The prototype Akro was, as promised, ready for the U.S. Aerobatic Championship at Reno in the fall of 1967. Margaret finished in second place, only a few points behind Mary Gaffaney in her Pitts.

The next Akro built by Clayton was the well-known, ventrally finned N6006N of air show pilot Dean Englehardt. By 1972, Clayton had built two additional Akros and the wing for the Akro that Leo Loudenslager was building.

LEO'S STEPHENS AKRO

Leo first saw a picture of Margaret Ritchie and her Akro in a 1966 issue of *Private Pilot Magazine*. By the spring of 1971, he had completed the first 200-hp Akro. Clayton drove the wing from Riverside, California, to Riverside, Connecticut, Leo's home. Clayton drilled the two spar bolt holes, and N10LL was in business.

Almost immediately, Leo began modifying his Akro. With ideas from Pappy Spinks, he added gap seals and the first real sighting devices used in competition aerobatics (called LLLs at the time: Loudenslager Line Layers). He beefed up the longerons after breaking two in flight. As Leo describes it, 4130 steel tubing makes quite an unmistakable noise when it gives!

Up to this point, most people's reaction to the size of the main spar was, "You'll never break that railroad tie." In February of 1975, during an inspection, Leo discovered compression cracks ran deep into the spar roots. At this point, Leo and his partner Jim Roberts decided that an almost complete rebuild was in order.

THE LASER 200

The year is 1975. Jim and Leo's first steps were to literally cut the airplane in half, keeping the aft half and building the remainder of the new plane onto it. They enlisted Richard Wilkerson of Ponder, Texas, to build the new wing. Over the next six months, the three men, along with Joe O'Shinski Jr. and Bud Storms, were able to finish the plane in time for the 1975 U.S. National Aerobatic Championships.

The most obvious visual change in the Laser design compared to the Akro was the raised turtledeck, implemented to increase the side area. After talking with Lycoming, the first crossover exhaust system was installed. The horizontal stabilizer was enlarged. The new airfoil was an interpolation of the Akro's NAA 23012, along with NACA 21012 and NACA 2112. Seventeen-gallon tip tanks in each wing drained into the main fuselage fuel tank. The builders' all-out effort to keep the plane light resulted in an empty weight of 842 pounds, down from the 967 pounds' empty weight of the Akro. The new plane would fly unnamed until an air show in Canada when a fan suggested the name "Laser," which Leo stuck with.

The 1975 U.S. Nationals at Oak Grove, Texas, saw the realization of the Akro/Laser's promise, as Leo won the first of his seven U.S. National Aerobatic Championships.



Leo Loudenslager stands by his Laser 200.

OF EXTRAS AND SUPERSTARS AND SUKHOI ...

The year is 1993, and over the last 25 years, everyone from Walter Extra to Henry Haigh to the Russians has taken a tape measure to the Laser and the Akro in pursuit of the ultimate monoplane. The philosophy behind the original Akro design was to build a competition plane as slow and light as possible, and thus as low-powered as necessary in order to win. Ever since then, monoplane power, and thus weight, have ratcheted ever upward.

ACKNOWLEDGEMENTS

I am grateful to the following people for their assistance in researching this article: Clayton Stephens (for dinner, too), Chuck Wentworth, Dan Rihn, Lew Shaw, Leo Loudenslager (via two hours of tapes recorded for Dan Rihn), and Bud Judy. **IAC+**

Reprinted from the January 1994 issue of Sport Aerobatics.



1970-2020

It's Where You Sit

BY FRED G. DELACERDA, IAC 12474

I WISH I COULD TELL YOU exactly how the conversation came about, but I can't, said Lynn Bowes, IAC secretary. I suppose out of the many conversations — brief or deep — topics surface that I just cannot shake. It seems that Debby Rihn-Harvey and I were talking about physical aspects of aerobatics and flying in general when the name Fred DeLacerda came up.

I first met Fred at an Okie Twistoff in Stillwater, Oklahoma, in probably 1988. Fred wrote many physiological-type articles for Sport Aerobatics between 1988 and 2000 in a series he titled "Human Factors." Those articles are as relevant today as ever because the physical aspects of aerobatics and flying never change. I wondered if I could find Fred and — thank you, Google — I could.

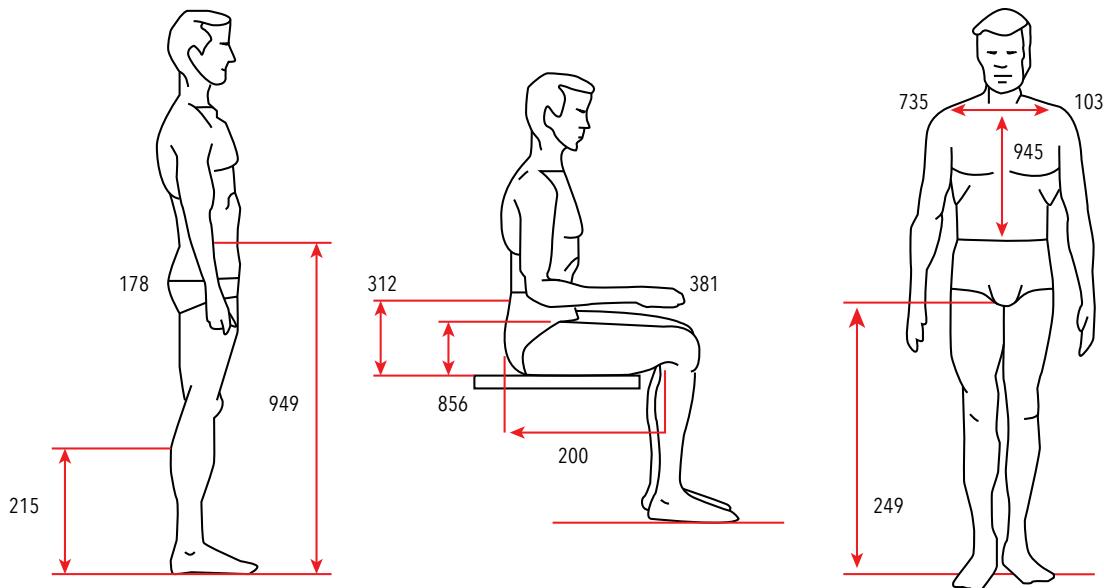
Fred communicates the old-fashioned way — telephone and handwritten letters. I dropped Fred a note to what I hoped was his address in Oklahoma, and lo and behold, he called! Fred gave the IAC permission to reprint his articles in Sport Aerobatics if they go no further than Sport Aerobatics. We hope you will respect Fred's wishes and simply read and consider what he wrote. Good stuff, all of it.

There was no question. It was a stall/spin accident. The small aerobatic airplane was observed by witnesses to be practicing aerobatic maneuvers. The airplane was observed to enter a spin during the half-roll at the top of an Immelmann. There was no recovery from the multiturn spin. Accident investigation and analysis failed to find a problem with the pilot or the airplane that would prevent spin recovery. The NTSB computer printout of the accident causal factors read as follows:

Aerobatics <> Performed <> PIC
 Stall/Spin <> Inadvertent <> PIC
 Emergency Procedure <> Not Correct <> PIC

BODY SIZE OF THE 40-YEAR-OLD AMERICAN MALE FOR YEAR 2000 IN 1g CONDITIONS

MICROGRAVITY NOTES	NO.	DIMENSION	5TH PERCENTILE (cm)	50TH PERCENTILE (cm)	95TH PERCENTILE (cm)
	949	Waist height	100.4 (39.5)	108.3 (42.6)	116.2 (45.7)
	249	Crotch height	79.4 (31.3)	86.4 (34.0)	93.3 (36.7)
	215	Calf height	32.5 (12.8)	36.2 (14.3)	40.0 (15.7)
	103	Biacromial breadth	37.9 (14.9)	41.1 (16.2)	44.3 (17.5)
1	946	Waist front	37.2 (14.6)	40.9 (16.1)	44.5 (17.5)
	735	Sye circumference	44.4 (17.5)	49.0 (19.3)	53.6 (21.1)
	178	Buttock circumference	91.0 (35.8)	100.2 (39.4)	109.4 (43.1)
12	312	Elbow rest height	21.1 (8.3)	25.4 (10.0)	29.7 (11.7)
	856	Thigh clearance	14.5 (5.7)	16.8 (6.6)	19.1
	381	Forearm hand length			
	200	Buttock popliteal length	46.9 (18.5)	51.2 (20.2)	55.5 (21.9)



This approach would seem to give a plausible explanation for how the accident happened, but it does not address why the accident took place. It would be easy to simply say this was a case of pilot error, a frequently used term for an unexplained airplane accident, but this term still does not give why the pilot made the error. To determine the human factors of this accident, it is necessary to review events prior to the accident.

The certified aerobatic airplane was a tried and proven design. Like most airplanes, the cockpit layout had been designed for the 50th percentile (average) adult. [Note: Anthropometry and percentiles refer to basic human dimensions, body shape, and size. People come in all shapes and sizes, so you need to take these physical characteristics into account whenever you design anything that someone will use, from something as simple as a pencil to something as complex as an airplane.]

However, the seat was nonadjustable. In fact, the only adjustment was the rudder pedals. There was a series of 3/4-inch adjustments in the pedal linkage, but this allowed compensation only for differences in leg length. While this allowed the 5th percentile pilot to reach the pedals, the pilot could not apply full range of motion to the throttle and stick. This single control adjustment ignored the proportional lengths of human extremities. Hence, making one control adjustable does not ensure a pilot “fits” the cockpit.

Consequently, in order to reach the controls, the pilot must adjust his position by using cushions in the seat pan to elevate him and on the seat back to bring him forward. Reach and full motion of the pedals, stick, and throttle are now possible. What is not apparent is the effect on the stability of the airplane.

Single-seat aerobatic airplanes have a small center of gravity (CG) envelope. Therefore, a pilot’s position in the seat can put the airplane on the front or aft end of the CG range. With the 95th percentile, the CG is in the extreme aft position and the airplane is sensitive in pitch whereas the 5th percentile pilot has a fore CG position with an airplane very stable in pitch.

In the accident noted here, the pilot was 5 feet, 5 inches in height and weighed 130 pounds, approximately a 5th percentile adult. To operate the controls, he had positioned himself well forward in the seat so as to be on the front edge of the CG envelope. The airplane then had a higher stall speed, increased wing loading and drag, and heavier control pressure at low airspeeds.

There was no problem flying the airplane, but he was not scoring well on certain maneuvers. For example, the spin was frequently downgraded because the judges did not think the airplane stalled as the pitch did not appear to be high enough. The looping radii on pull-ups and pull-outs were large, giving the appearance of no lines between figures.

WHY FLY THE REST COME FLY THE BEST, MX.



MX is a multiple aerobatic competition winner and an unbelievable air show performer with an all carbon fibre aerobatic design. Setting the benchmark in unlimited performance aircraft MX has a range of features including:

- Well-mannered aircraft
- Unmatched manoeuvrability at +/- 14G's
- Roll rate in excess of 420degrees/second
- Thousands of hours of flight testing
- A fast-cross country sports plane with a cruising speed of 200 knots and up to 900 miles of range!

www.mxaircraft.com

+1 (704) 607 6609 info@mxaircraft.com

You Can't Scare Us!

We Can Teach ANYONE to Land a Pitts!

- 44 Years Experience.
- Train for Skybolt, Eagle, Model 12, S-1S, etc.
- We love crosswinds.
- We love low time pilots.
- We love narrow, short runways.
- Yeah, we love akro too.

Stay at “Our Place”—Families Welcome!

Pool Area



Budd Davisson's
Plus 5 Aviation, LLC

602-738-2045 - buddairbum@cox.net - Phoenix, AZ 85028

Visit us at www.airbum.com

Consequently, the pilot wanted to move the CG aft. Adding weight behind the seat would work, but the amount needed significantly added to the weight of the airplane. So, it was decided to add the weight as far aft as possible so as to have a large moment arm with a small weight. Through trial and error, a weight of 7.5 pounds was attached to the tail post. A check of the weight and balance found the CG to be within limits. What was not readily apparent was the alteration to inertia.

All pilots are familiar with moments, but few are knowledgeable about the moment of inertia. Moment of inertia depends on the shape and distribution of mass about the axis of rotation. A moment is calculated by multiplying the moment arm times the weight, but for moment of inertia, it is moment arm *squared* times the weight. A small weight with a long moment arm significantly alters the moment of inertia. It is possible to have a moment of inertia so large there is not enough aerodynamic force from the control surface at full deflection to overcome the inertia. In this particular case, the pilot had stayed within the envelope but had created a significant change in the moment of inertia due to the long moment arm from the CG to the weight on the tail post.

In the spin, an airplane goes from a transitory to a rotatory motion. During the transitional stage, the incipient stage, the aerodynamic forces and the inertia forces are developing. When in the developed stage of the spin, these forces are in equilibrium. During recovery, control changes provided the aerodynamic forces needed to offset the inertia forces. In this accident, the inertia had been changed to the point that aerodynamic forces from control input were not sufficient to overcome inertia. This detail had not been noted by the pilot as he had always kept within the incipient phases of the spin where inertia forces were not fully developed. In this stage, control deflection produced aerodynamic forces sufficient to stop pint rotation. With an inadvertent entry into the spin from the Immelmann, the pilot allowed the airplane to progress to the developed stage of the spin where spin recovery was not possible.

An accident is never the result of a single event or cause but has multiple events that take place in a particular order so as to end with the accident. Such a series is often referred to as an accident chain, and accident prevention is the recognition and breaking of the chain before the accident happens. In this accident, the chain of events started with a human factor problem in the cockpit.

The cockpit of an aerobatic airplane should not be an afterthought but a carefully planned arrangement of controls and instruments so as to fit the pilot. Don Hartmann, in his EXTRA 300S with well designed cockpit and adjustable seat, prepares to take his turn in the box at the 2019 U.S. National Aerobatic Championships.



The human factor chain of events was as follows. 1. Due to his physical size, the pilot could not reach all the controls. 2. Since the seat was not adjustable, the pilot had to position himself on the forward portion of the seat. The result was a fore CG that prevented adequate aerobatic performance. 3. The CG was adjusted by addition of a small weight at the extreme aft end of the airplane that significantly altered the moment of inertia due to the long distance from the CG to the attachment point. 4. Because of the alteration, recovery from a developed spin was not possible since there was not sufficient control surface for aerodynamic forces to overcome the inertia. 5. An inadvertent spin was allowed to reach the developed phase. 6. With no recovery possible, there was a fatal crash.

This accident was not due to pilot error but was the result of a series of events beginning with a human factor situation that existed in the cockpit. Training in spin recovery would not have prevented this accident.

Traditionally, airplane cockpits have been poorly designed. There are so many other design features to consider for the total airplane that the cockpit is not given much thought.

While small general aviation aircraft in general, and aerobatic airplanes in particular, have sparse cockpits, the cockpit still must fit the pilot. Although some items such as location of instruments, switches, etc. may seem insignificant, it is possible to create a cockpit design that actually increases the probability of the pilot making a mistake, a mistake that starts an accident chain.

The purpose of this article is to introduce the aerobatic pilot to the concept of human factor considerations in cockpit design by taking an actual accident and analyzing it from a human factor viewpoint. The cockpit of an aerobatic airplane should not be an afterthought but a carefully planned arrangement of controls and instruments so as to fit the pilot. The cockpit is where the pilot interfaces with the airplane. The better the interface, the better and safer will be the performance. *IAC*

Reprinted by permission from the January 1994 issue of Sport Aerobatics.

OUR HISTORY IS OUR FUTURE

ROLL WITH US!
JOIN today
www.iac.org/roll-us

Frank Price
IAC 10
With his Jungmeister

IAC 50
1970-2020



OFFICERS

PRESIDENT Robert Armstrong	TREASURER Bob Hart
VICE PRESIDENT Doug Bartlett	SECRETARY Lynn Bowes
EXECUTIVE DIRECTOR Stephen Kurtzahn	

BOARD OF DIRECTORS

NORTHEAST REGION DIRECTOR Rob Holland	CIVA RELATIONS Mike Galloway
SOUTHEAST REGION DIRECTOR Ron Schreck	COLLEGIATE PROGRAM Jordan Ashley
MID-AMERICA REGION DIRECTOR Justin Hickson	CONTEST SANCTIONING Robert Armstrong
SOUTH CENTRAL REGION DIRECTOR Tom Rhodes	EDITORIAL COMMITTEE Robert Armstrong
NORTHWEST REGION DIRECTOR Peggy Riedinger	EXECUTIVE COMMITTEE Robert Armstrong
SOUTHWEST REGION DIRECTOR Jim Bourke	FINANCE COMMITTEE Bob Hart
INTERNATIONAL DIRECTOR Debby Rihn-Harvey	GLIDER AEROBATICS Jason Stephens
DIRECTOR Bruce Ballew	GOVERNMENT RELATIONS Bruce Ballew
DIRECTOR Bob Freeman	HALL OF FAME COMMITTEE David Martin
EAA REPRESENTATIVE Open	IAC HISTORIAN Mike Heuer
NAA REPRESENTATIVE Greg Principato	JUDGES PROGRAM Weston Liu
ACHIEVEMENT AWARDS CO-CHAIRS Dave Watson and Brittanee Lincoln	SEQUENCE COMMITTEE Michael Lents
ANNUAL AWARDS Patty Anderson	MEMBERSHIP COMMITTEE Jim Bourke
CHAPTER RELATIONS Peggy Riedinger	NOMINATIONS Doug Sowder
	RULES COMMITTEE Doug Sowder
	SAFETY COMMITTEE Keith Doyne
	TECHNICAL COMMITTEE Tom Myers

★ AcroBelt ★
5-Point Ratchet Seatbelt System
Customized To Fit Your Aircraft
Details at:
www.SilverParachutes.com
plus

- Largest Dealer for Softie Parachutes
- Great Deals on New & Used Parachutes
- S.M.A.K. PAK™ Parachute Survival Kits
- Bailout Safety Seminars Worldwide

Silver Parachute Sales & Service
Phone: 209-532-7070
Email: Allen@SilverParachutes.com

HARDY AVIATION INSURANCE | AssuredPartners
479.283.1288
Matt@HardyAviationIns.com




SMOKE SYSTEMS & OIL
419-360-7414
WWW.SMOKE-SYSTEM-HELPER.COM

IN THE LOOP
STAY CONNECTED with IAC's member benefits, and the world of aerobatics on the web, in our e-newsletter!

TO SUBSCRIBE:
WWW.EAA.ORG/NEWSLETTERS



MIKE'S AeroClassics
Inspect | Repair | Restore
Your tube-and-fabric specialists!
Phone: 925-453-2507
www.MikesAeroClassics.com



DENT-AIR, LTD.
FACTORY DEALER FOR PITTS SPECIAL
Located At Lee Airport
Annapolis, Maryland
Aerobatics & Spin Training
Pitts Sighting Devices
BILL FINAGIN
Hangar 410-956-0047 Home 410-263-2740
Cell 410-353-2622 E-mail wbfagin@cs.com



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



*Para-Phernalia Inc.
Thank You!
Kelly R. Neil*

At Para-Phernalia we are very proud that Softie parachutes were instrumental in saving four lives in 1999.

SOFTIE 
EMERGENCY PARACHUTES
THE PROFESSIONALS CHOICE
from Para-Phernalia, Inc.

Toll Free: 800-877-9584
Intl: 360-435-7220
Fax: 360-435-7272
www.softieparachutes.com



© 2020 Experimental Aircraft Association, Inc.

A WHOLE NEW WAY TO ROLL

The EAA and International Aerobatic Club Aircraft Insurance Plan has all the special coverage options IAC Members require for recreational aerobatics, aerobatic competition and practice, airshow performances, and aerobatic flight schools. Visit [EAA.org/Insurance](https://www.eaa.org/Insurance) today for the right coverage at the best price for you.

Aircraft | Personal Non-Owned | Powered Parachute & WSC Trike | Accidental Death & Dismemberment | Flight Instructor | Hangar | Airport

 Insurance Solutions

Administered by Falcon Insurance Agency, Inc.

[EAA.org/Insurance](https://www.eaa.org/Insurance) | 866.647.4322

When you insure with the EAA Aircraft Insurance Plan you are helping IAC promote and enhance the safety and enjoyment of aerobatics.