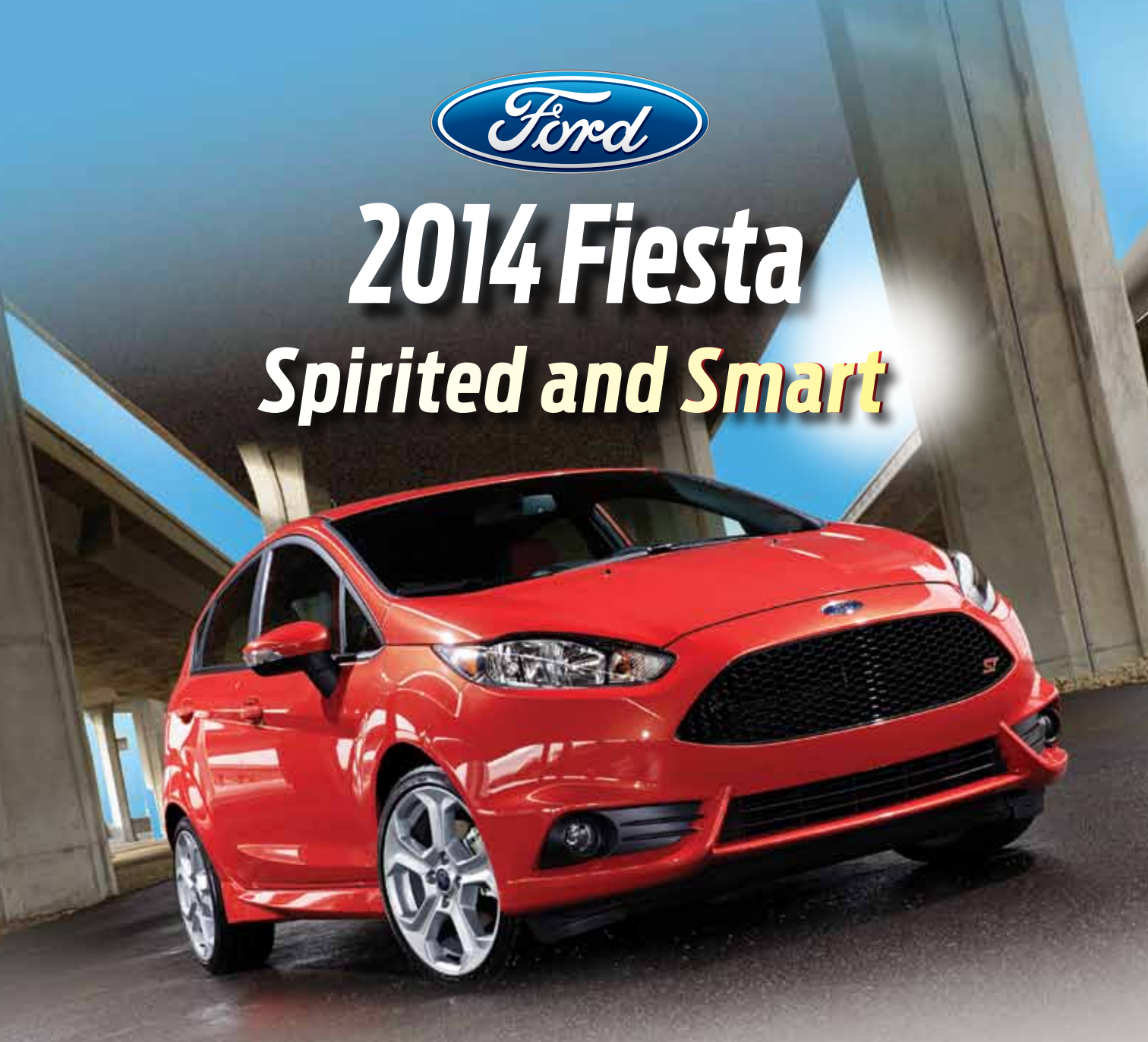
August 2013

Aerobatics

OFFICIAL MAGAZINE of the INTERNATIONAL AEROBATIC CLUB

Formation FLYING

- So Now What?
- Flight Level 220 in a Pitts



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Sport Aerobatics

CONTENTS

Vol. 42 No.8 **August 2013** A PUBLICATION OF THE INTERNATIONAL AEROBATIC CLUB

Once you and your teacher are happy that you can safely practice on your own, go for it! —Doug Jenkins

FEATURES

LEIF CULPIN

COLUMNS

DEPARTMENTS

THE COVER

Formation flying during AirVenture 2012; shot by Brady Lane.

SPORT Aerobatics
OFFICIAL MAGAZINE of the INTERNATIONAL AEROBATIC CLUB

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

Rooting for the home team

Months of excitement ahead

WHAT TO WRITE? That's the question when I sit down to type out my letter from the editor every month. In the world of aerobatics—especially this year—we in the U.S. are privileged to be hosting the Unlimited World Aerobatic Championships. Preparations are nearly complete, and October is just three short months away. Having had the honor of meeting many of this year's participants, I'm rooting for the home team and hoping for the best. It should be a fun ride!

> . . . we in the U.S. are privileged to be hosting the Unlimited World Aerobatic Championships.

The August issue is a funny thing—due to lead times for publication, we're already buttoning up this issue while AirVenture is still more than two weeks away. I'll be there again, staying in my teardrop trailer. I only wish I had a wing to sleep under—that's been a dream of mine since childhood. If you haven't camped at AirVenture, I'd sure recommend it—but take a bicycle. The distances are enormous if you don't have one, but completely manageable otherwise. Shower facilities are some of the best I've encountered at a public venue, and the port-a-potties are cleaned regularly. Having stayed at hotels previously, I'd go the camping route for sure. I went off on a bit of a tangent there, but what a fun time!

This month, you'll read about two early IAC members who were instrumental in helping the organization become what it is today. Carl Bury and Roscoe Morton left indelible footprints on our organization, and I wish their families my heartfelt condolences.

You may remember reading about Doug Jenkins' foray into the world of competitive aerobatics in his newly acquired open-cockpit Pitts S-1 a few months back. Doug had just returned from a tour flying his F-15 overseas, and picked up his new purchase after buying it sight unseen. He then went on to fly his first-ever competition in his little yellow biplane—at Nationals no less! He decided to write a follow-up article to encourage fence-sitters to take the plunge and get into competitive aerobatics with a step-by-step tutorial. His is a reminder of the fun and excitement waiting for those who decide to join the exclusive world of competition aerobatics.

The next three months promise a lot of excitement. AirVenture, Nationals and the WAC should provide quite a bit of fruit for fair-weather reading during the cold months of winter. I'll see you next time. *IAC*

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

by **MIKE HEUER,** IAC President Emeritus, IAC 4

Carl Bury

IAC President 1978–1981

(Editor's note: This story is told in the first person by IAC President Emeritus Mike Heuer.)

THE IAC WAS SADDENED BY the news that Carl Bury passed away on May 31st at 81 years of age.

Carl was president of IAC from 1978 to 1981. I served as his vice president from 1979 and followed him in office as president. A very dynamic, smart guy with a real head for business, he came to our attention when he was head of Chapter 34 in Ohio. The Chapter used to put on some great contests in Ohio—mostly in Medina as I remember. Verne Jobst asked him to serve as his VP and then he moved into the presidency after Verne's retirement.

After his retirement from the presidency, he continued on the IAC board and later the EAA boards. He retired as a director emeritus in 2008.

Fond du Lac was the IAC's major event at that time, and he was very active in the organization of that contest. Some of Carl's singular achievements included organization of a merchandise program for IAC; starting the ball rolling on IAC becoming a division of NAA with full FAI responsibilities here (which were completed during my term); building of the first IAC pavilion in 1980 and in time for the WAC which was held that year in Oshkosh; and all sorts of other projects.

He was a dynamo.

His memorial was held at the Skidaway Island United Methodist Church on June 15 at 11:00 a.m. Remembrances can be sent to that church's Music Ministry; Hospice Savannah; and the Humane Society of Greater Savannah.

IAC


Carl Bury

by John Musgrave

Carl F. Bury, third President of the International Aerobatic Club, has been interested in airplanes since he was a youngster. He was the kid on the block building models, took his first ride in a J-2 in 1944, and still remembers the cover of an aviation magazine showing a photo of a yellow Beech Staggerwing and thinking it was one of the most beautiful things he had ever seen.

Carl's interest really picked up when he was able to "borrow" some instruction from a couple of L-19 spotter plane pilots attached to his battalion during the Korean War. After this police action, Carl finished college and entered the aluminum business. When finances permitted, Carl obtained his private license.

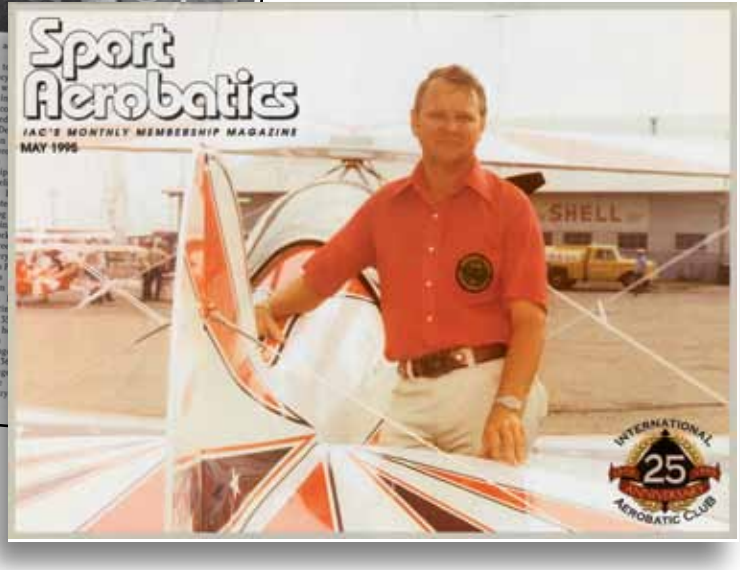
A trip to Oshkosh was his undoing...he thought it was fantastic, but with a great drawback, camping under the wing. That problem was solved as

Carl became a ... and EAA.

Introduced ... Dyer and Nancy ...

Carl Bury during an interview with ESPN

Sport Aerobatics May 1996



by **MIKE HEUER,** IAC President Emeritus, IAC 4

Roscoe Morton

The Voice of EAA Oshkosh

JIM KOEPNICK

Over the past 30 years, there has scarcely been a person who has attended the EAA fly-in (now known as AirVenture) who has not heard the voice of Roscoe Morton, also known as the "Voice of Oshkosh," over the public address system. Over the years, he announced hundreds of air show performances and interviewed countless aviation personalities during the course of his service to EAA—both at Oshkosh and the Sun 'n Fun Fly-In in Lakeland, Florida, and many other aviation events. We are sad to announce that Roscoe passed away on Saturday, June 15, at his home in Frostproof, Florida, at the age of 81.

What many IAC members do not know is that Roscoe was IAC 11 and was one of those men and women who were instrumental in the revival of aerobatic competition in the 1960s as well as IAC's foundation and development in the early 1970s. This author first met him in 1965 at a small aerobatic contest in Ottumwa, Iowa, that was held in conjunction with the Antique Airplane Association Fly-In. This was during the same time period America was becoming more involved in international competition.

Roscoe had always loved aerobatics, and American teams going overseas had piqued his interest. He immediately threw himself into it and joined the Aerobatic Club of America and volunteered to help. His support of U.S. participation at the World Aerobatic Championships culminated in becoming U.S. Team captain at the WAC in 1968, 1970, and 1972. His judging skills, knowledge of the judging criteria, and the new Aresti system became his specialties. Team pilots and other prospective competition pilots and enthusiasts

consulted with him and sought his help in understanding it all.

In 1970, after IAC was formed, he was one of the first people IAC President Bob Heuer met when the rules for our first contest season were written. In January of 1970, Bob Heuer and this author embarked on a 10-day odyssey in our family Bonanza that took us to Louisville, Kentucky; Atlanta, Georgia; Okeechobee, Florida; Homestead, Florida; New Orleans, Louisiana; Waco, Texas; and Kansas City, Missouri. At all of those stops, we met with the aerobatic leaders of the day and reviewed that draft of the rule book with all of them. The New Orleans stop was to see Roscoe, and after we completed that whirlwind tour, we came home, put the finishing touches on the book, and off it went to the printer in Wisconsin. The IAC was launched in the contest business, and our first aerobatic contest was held that spring.

Because of his help, Roscoe Morton was presented IAC membership number 11. His input was enormously helpful, and he remained a friend to aerobatics and our family throughout the years.

In 1972, he and Team Manager Frank Christensen (of Christen Eagle fame) worked with the team in turning out one of its best performances in aerobatic history. The U.S. Team swept the 7th FAI World Aerobatic Championships in Salon de Provence, France. Charlie Hillard won the World Aerobatic Champion title, Mary Gaffaney became the Women's World Aerobatic Champion, and the U.S. Team captured the Nesterov Trophy. It was a record of which Roscoe was very proud.

After leaving the team, Roscoe turned his attention to air show announcing and later the "interview circle" at Oshkosh. Though a quiet man in private, he had a deep love of people and aviation that made an interview conducted by Roscoe both interesting and comfortable for those who shared the microphones. These talks provided hundreds of hours of education and entertainment for aviation enthusiasts who listened in and watched.

Aside from thousands of hours of volunteer work, Roscoe was also a mentor to young men like me. I credit his help and encouragement in helping me fulfill my dream of an airline career. He started his own pilot career with Southern Airways and became a chief pilot and check airman with that company, which after several mergers became part of Northwest Airlines. He retired as a captain on the Boeing 747. Because of injuries suffered in an airplane accident in the 1960s, Roscoe was never able to compete himself—though I imagine he would have been a fierce competitor. He did own sport aircraft over the years.

Born in the tiny town of Elk Falls, Kansas, in 1931, he was buried there on Thursday, June 20. He traveled a lot of miles over the years and enjoyed the hundreds of friends he made along the way. We will miss him always. IAC

So now What?

LAURIE ZALESKI

by Doug Jenkins

Well, perhaps you took my advice to heart and found yourself an airplane capable of aerobatic flight. So, what happens next? (Note: If *you* are capable of aerobatic flight, you may skip the remainder of this paragraph. The narrative flows just fine if you do this.) Well, if you are not capable of aerobatic flight, let's get there first. Your IAC has resources (schools list, local chapters) available to get you connected with someone in your area who can get you started on this journey. Find yourself a teacher you are comfortable with and jump in. If your aircraft is a two-seater, then it makes sense to use it for your training; if it's not, invest the money in dual in another airplane. Your course of training does not need to be over the top; it needs to be enough to get you comfortable with the basics. Can you get yourself into and out of a spin? Can you consistently fly a figure without gross error (i.e., can you fly a loop without falling out of it)? Can you maintain situational awareness as you fly a sequence of a couple of maneuvers strung together? Once you and your teacher are happy that you can safely practice on your own, go for it! Then the question becomes . . . what, exactly, do I practice? How do I invest those very expensive dead dinosaurs to best effect?

If you are like most pilots, you like having a goal to strive toward. Might I suggest that getting competition ready is a worthy use of those dead dinosaurs sleeping in your gas tank right now? *What? Wait, I just bought this airplane, got a couple hours of dual, and now you want me to compete?!* Yep, I do. Here's why. I'll let you in on some secrets:

1. Competition is a lot of fun.
2. Competition is not that tough.
3. Competition is highly rewarding.

In terms of fun I can't think of anything that offers as much bang for your aviation buck. Given that you are holding this magazine and reading this article I am guessing that you progressed beyond the $100 hamburger a while ago. You, in your infinite wisdom, have decided that pulling *g*'s and flying upside down (inverted, if you will) is the way to go. Why not focus a little more tightly and bring that goal-oriented personality into play? Flying random loops to music is certainly fun. Flying loops against the standard of perfection (No, really, has anyone ever scored a 10 on a loop?) is way more fun!

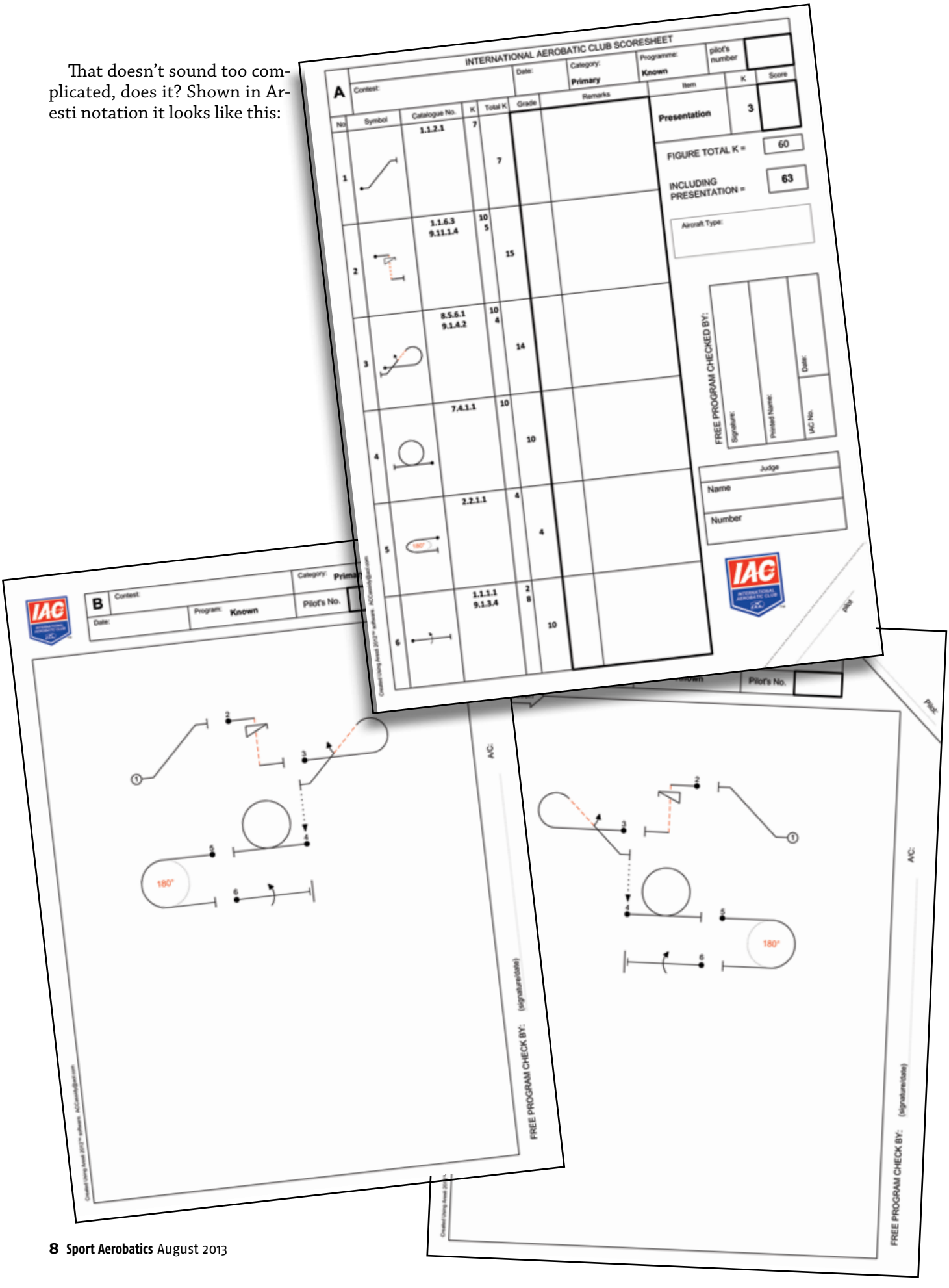
Well, it may be fun, but it takes super-human abilities to fly competition aerobatics, right? Wrong. Trust me, if I can do it, you can do it. If you have never attended a competition, go visit one some weekend (more on this later). You will see all levels of pilots. Some have years of competing under their belts and fly maneuvers you can't even begin to imagine in airplanes that are quite capable of crushing you like a bug. Some are at their first competition and have less flying time than you do. The IAC even has a category of competition to suit the first-time competitor—Primary. The Primary category sequence consists of six maneuvers that serve as the building blocks as you move up (if you decide to move up). If you can fly these maneuvers well, then you are on your way to competitive success. The Primary sequence is:

1. a 45° upline
2. a one-turn spin
3. a half-Cuban-eight
4. a loop
5. a 180° turn
6. a slow roll

Find yourself a teacher you are comfortable with and jump in.

LAURIE ZALESKI

That doesn't sound too complicated, does it? Shown in Aresti notation it looks like this:



Okay, there you go, what is this Aresti notation you speak of? Do you competition guys have some secret code? Is there a secret handshake, too? Aresti is, I suppose, a kind of code, but it is certainly not secret. It is simply a system of notation that allows every aerobatic maneuver to be depicted on paper and assigned a K-factor, or degree of difficulty. The Aresti system is used worldwide, thus assuring standardization and a level playing field in every competition. Learning it is as simple as ordering the book and reading through it a few times. It took me a while to grasp what I was looking at, but I am not the sharpest knife in the drawer. And, for your first few runs in Primary, all you need to know is your six maneuvers anyway. This is not rocket surgery. As for the secret handshake . . . I could tell you, but that would take all the fun out of it.

Okay, I'm tracking with you so far. You said it was rewarding. What kind of reward are we talking about here? I am referring to the reward of having your performance judged against the standard of perfection. The judges at a competition do not care what kind of airplane you are flying. As a matter of fact, the rules are written so that aircraft performance (within a category) is as little of a factor as possible. Nor do the judges care who is flying; they do not even know the name of the pilot they're watching. Judges are charged with only one job: evaluating the lines, loops, and angles they see against the ideal of a perfect figure. And of course there is the big prize money. *Seriously, how much are we talking about?* Most every contest awards the square root of zero dollars to the winner of every category. *Hey, wait a minute; I see what you did there.* That's right the rewards are internal: am I better today than I was yesterday; did I stay in the box; did I meet my personal goals; did I correct for the winds well; did a pilot I admire compliment my performance? You get the idea. If you enjoy working hard, striving for improved flying performance (whether that improvement is miniscule or dramatic), and shooting for perfection then, what are you waiting for?

Okay, you convinced me, I'm in. How do I get ready? What do I need to do before my first contest? There is no cookbook solution or answer. I can tell you what made sense to me, but your results may vary, and I offer no guarantees. Here is how I found myself at my first contest and how I got ready. First of all,

LAURIE ZALESKI

I had no intent of competing as soon as I did. I, like you, thought I needed much more preparation and seasoning before taking the plunge. It was actually after my first Pitts flight when my instructor mentioned that Nationals was in a few weeks and I should think about going. I laughed because I assumed he was kidding. That's when he explained Primary to me. It sounded like it was actually doable so I went home and took **Step Number One**: I downloaded the *IAC Official Contest Rules* and the Primary sequence. That led rapidly to **Step Number Two:** I read the rule book and printed out figure cards to put in my airplane. I admit that I am lazy, so I only read the sections of the rule book that applied to me (yes, I skipped the section outlining the duties of the registrar and all of Chapter 6). As for the figure cards, you may think, "I can remember six maneuvers, come on." Trust me, you will want them in your cockpit!

Armed with this new information I moved on to **Step Number Three:** I began flying the Primary sequence over and over and over again. I found I really enjoyed this. Instead of flying random maneuvers for the heck of it, I now had a template to follow, a performance criteria to meet. I wanted to fly the perfect 45-degree upline (as a side note, here's how to determine if you have flown the perfect 45-degree upline…if three judges say steep and three judges say shallow…it was perfect!). I wanted my maneuvers to flow seamlessly. I wanted to achieve the ideal. So I practiced—a lot. Then I realized something. What if what I was practicing over and over and over was wrong? Yikes. This led me to **Step Number Four:** get some critiquing from an experienced aerobatic pilot, prefer-

LAURIE ZALESKI

ably a judge. In my case I waited a little too long to do this. It was two days before the contest. Oh well. It still helped and enabled me to fix some fairly gross errors ahead of time. Once you find your critic/coach, offer to buy them lunch or dinner in exchange for feedback on your performance. Be prepared to receive this critiquing in the spirit it is intended. When you hear that the maneuvers you worked so hard to craft are not quite perfect, this is not the cue to pout; it is the cue to take the comments to heart and fix the flaws your "coach" sees. This is how you get better!

Step Number Five is optional, but I believe quite helpful. Attend a contest as a spectator/volunteer. This is a great way to get the rhythm of the event and put some of your book knowledge into practice. In my case I went to Hammer Fest 2012 in Llano, Texas. Within half an hour of arriving I was a recorder on the judging line. Hold on, here we go. I learned more in those few hours in the hot South Texas sun than in five practice flights. I figured out what the judges were looking for, how pilots got into and out of the box, how pilots put maneuvers together, etc. In short, from the safe perspective of a spectator/volunteer I learned how a contest worked and how to operate safely in that environment.

After my day in Llano I decided I really was ready to compete. I had been to the Waffle House for a couple of weeks; one day raring to go, the next day convinced there was no way I was ready. But now, having seen what I was actually getting myself into, I was prepared to take the plunge and move on to **Step Number Six:** register for a contest. The IAC website has a calendar of available contests and the link to the registration site. You can also show up and register on-site if you are technologically challenged. If you go this route, a courtesy call to the contest director is a good idea so they know how many to plan for. No matter how you register, pick a contest and commit to it!

Well, in my case it turned out that the only remaining contest for the year anywhere near me was... Nationals. Why not, what could possibly go wrong? I guess there's nothing wrong with being last, is there? Is there? The web-based registration process was easy enough, and the flight up was a simple two-hop from San Antonio to North Texas Regional for **Step Number Seven:** showing up to your first contest. The key to success here is to be prepared. From the IAC website I had printed the "Aerobatic Contest Checklist," and it turned out that by making sure I had all of that stuff covered, the process was pretty easy. The highlight pitfall I will point out is insurance (make sure you have enough coverage and paper that proves it). The rest of it is pretty easy if you, your airplane, and parachute are legal to fly.

So what happens after I get there? Upon arrival you and your airplane will be "tech inspected." This is where the contest officials make sure that everything is safe and legal. Just have the stuff from the checklist and an airworthy airplane and parachute and this is a breeze. The next step is to finish up the registration paperwork. Then (probably) sign up for a practice slot unless you did this in advance. *I highly encourage* a practice flight. My practice flight was my first time talking to a starter, getting cleared into the box, etc. Actually, my practice flight was the first time I had seen "the box" in my life. And, yes, it seemed about the size of a postage stamp (this is an obligatory statement I am required to insert here). Then I remembered I was flying Primary, and that there were no penalties for "outs" anyway. Rule book study paid off. Yes!

To help you succeed as a first-time competitor you should be offered a "buddy" to help you through the event. This will be an experienced pilot to answer your questions and get you where you need to be when you need to be there. If you are not offered someone like this, approach a contest official, explain you are a first-time competitor and would like a mentor. One will be forthcoming in no time.

Let me play the role of virtual mentor here and walk you through some of the basic contest goings-on from the comfort of your couch. On each day of competition flying all participants will gather for the

morning briefing. Don't miss this (see rule 4.6.1). Here are the things I believe you *must* take away from this briefing:

- Order of flight for your category (i.e., when are you and your airplane due to be on the line and ready to go, who do you follow, and where is "the line" anyway).
- Frequency for the box.
- Holding plan (if any).
- Direction of flight.
- Starting line procedures.

Do not walk away from this meeting with *any* questions unanswered!

All that remains now is to fly. You will position your airplane where and when directed by the starter. This person will tell you when to start, when to taxi, where to go after takeoff (to hold or directly into the box, for instance), which pilot you are following, and if there have been any changes since the briefing. Listen up; this is good stuff. Start, taxi, and takeoff should be no big deal. Now make sure you get on the right frequency at the correct time and listen for the chief judge in your ear. He or she will call you by name and utter those fateful words, "Cleared into the box!" This is where all your preparation pays off.

At least for some; for me it went something like this…most of my first sequence took place in Oklahoma. In my defense, Oklahoma was not actually that far away, and the winds were kind of strong. Also, after I landed I became convinced that I had forgotten to fly the half-Cuban in my sequence. Remember, I said you'd want the sequence on your panel and you scoffed at me and said you could remember six measly maneuvers? Well, I had the card in front of me, but after the flight I had zero recollection of flying that particular maneuver. It wasn't until the scores were posted and I had scores for the half-Cuban that I decided I must have actually flown it after all! My point is that it all went by in a blur, like attempting any complex activity for the first time. But…it was an absolute hoot! My grin after landing was ear-to-ear, and it only got wider when a fellow pilot said to me, "Well, you're a competitive aerobatic pilot now." Overflowing with pride was the only way I could possibly feel at that moment.

When you are not flying or getting ready to fly, you should be offering to volunteer. This helps the contest organizers out and greatly accelerates your learning curve. Some of the possible jobs to volunteer for are recorder, boundary judge, assistant judge, chief judge assistant, and general go-fer. Initially I recommend recorder and go-fer. These two jobs require the least in-depth knowledge of competitions in general and Aresti proficiency in particular but are still critical to success. As a recorder you will sit with the judge and note their scores and comments for each competitor's maneuvers. This is a *huge* learning opportunity. You are watching figures flown and getting firsthand, real-time input from the judge on how it looked versus how it should have looked. Once your Aresti improves and you know where each figure starts and ends, you are ready to become an assistant or boundary judge.

One final thought before I wrap this up; I believe that you will find that, although it is a competition, it is not like it is some kind of dog-eat-dog hate fest. I think that this is because we are (in my view) not competing directly against the other pilots; we are all competing against the standard of perfection. My fellow Primary pilots at last year's Nationals were a great group, and I really enjoyed talking to and learning from them over the week. We talked before and after flights, sharing tips on how to fly better in general and in the particular conditions that day as well. Nobody played "I have a secret" because we all wanted those around us to fly to the best of their abilities. I learned more on the ground than I did in the air over the course of the contest and left the event convinced that I would be back for more of that kind of personal growth, learning, and fun. Which leads to **Step Number Eight:** keep going back! Too many people today have short attention spans and seem to flit from activity to activity. Well, there are infinite challenges to be had in competition aerobatics, and it should be able to hold your attention for quite some time. Maybe even a lifetime! This year I am flying Sportsman and enjoying the challenge of a more complex routine and the ability to create a "Free" program if I so desire. (By the way, I built one that looked great on paper. In the air, well, not so much. Back to the drawing board I guess.) Some pilots move up to Intermediate to experience the thrill of the dreaded "Unknown." Some people become judges to enhance their knowledge of the sport. Some upgrade their airplanes in quest of ever more performance. Whatever turns your prop, go for it. There is never an excuse for being bored around competition aerobatics!

Well, this concludes another missive. My motivation for writing this time was to answer questions that I had as I was starting out last year. I figured if they were questions that I had, then maybe there were others out there with the same questions. Like many folks it takes a little nudge to get me started, but once I get going the inertia takes over. Last year my instructor's encouragement and my visit to Hammer Fest were my nudges. I hope that this article can be your nudge and that I have convinced you that flying aerobatics in competition is fun, not too tough, and very personally rewarding. I look forward to seeing you at a contest soon and hearing your story! IAC

Flight Level 220 in a Pitts

With a little help from modern electronics.

BY SPENCER SUDERMAN

Walk the ramp at any aerobatic contest and you will see three kinds of planes: the antique design characterized by the steel tube fuselage with fabric-covered wood wings, the modern design made of composite fiber reinforced plastic, and the hybrid with its steel tube frame and composite wings. Look under the cowlings of any of these and you will see engine technology that is fundamentally unchanged since its introduction in the 1930s!

Having recently installed an Electroair EIS-61000 electronic ignition system for the Lycoming IO-540 engine on my Pitts S-2B, I can attest that the future has arrived for the piston-powered airplane. The electronic ignition system (EIS) has immediate and noticeable benefits that include fast and reliable starting both cold and hot, smoother engine operation, more horsepower, and lower fuel consumption. It is the kind of improvement that you feel the moment you advance the throttle for the first takeoff and continue to notice during the climb-out, especially if you blast off at V_Y (best rate of climb)! You notice it during the tail slide as you back up and expect the rumpety-rumpety sound of an engine that's about to quit but instead just idles smoothly! You notice the increased service ceiling, and you *really* notice it when you refuel the plane and spend less on gas!

Several electronic ignition systems have come on the market over the last few years, but the one that has the best chance for widespread adoption and that has

The timing gear as installed behind the crankshaft flange.

already been issued an STC that covers most of the common four-cylinder engines and airframes is the EIS-41000 from Electroair of Howell, Michigan. When I heard last year that it received the STC and was working on adding six-cylinder engines to the approved list, I called Electroair to get the details. As it turns out, the company was in the final stages of the process and had already flight-tested the system on a Continental-powered Cessna 182 and a twin Lycoming-powered Piper but was still looking for a single-engine Lycoming-powered plane. It seems timing is everything. I was looking for a way to increase my service ceiling for another project focused on inverted flat spins, so this quickly became a win-win scenario, and proving the system works in an aerobatic plane accomplishes many objectives at once.

From this point the approach was straightforward: Electroair wrote a test plan that was approved by the FAA and required my plane to be temporarily issued an experimental R&D airworthiness certificate so that the system could be installed in place of one of the magnetos (more on this below), then it was run through a series of flight tests that included all aerobatic maneuvers listed in the POH and a high-altitude flight to determine the improvement to the service ceiling. Now that the flight tests are complete the data will be used to submit the final application for the amendment to the STC by Electroair. When the STC is updated the plane will be returned to standard airworthiness and be the first certified aerobatic plane with the Electroair EIS.

Having previously reached a maximum altitude of 21,000 feet during a flight on March 10, 2011, that lasted 41 minutes and burned 13 gallons and saw the manifold pressure bottom out at 13 inches, the maximum ceiling flight test conducted on June 22, 2013, with the Electroair EIS

showed a significant improvement. A maximum altitude of 22,000 feet was reached, and the plane was still climbing although at only 100 feet per minute with a manifold pressure of 12.5 inches; the flight duration was 54 minutes—yet only 11.2 gallons was burned!

The full flight can be seen in this video: *http://youtube/QwMbnYEaidw*.

The modern piston engine design in planes is similar to the original internal combustion engines of the late 19th century; however, cars have benefitted from improvements to engine management such as electronic ignition with variable timing to improve performance. Over the last several decades while the aircraft engine has languished with its fixed-timing magnetos, automobile manufacturers have become very good at extracting every bit of horsepower and fuel efficiency from powerplants, and it's time that the aircraft industry joined the 21st century.

The complete kit before installation.

The MAP sensor and controller as installed on Suderman's Pitts.

The magneto is a reliable workhorse that has its own generator, coil, and distributor that can fire a little bit of electric current across the tiny gap in the spark plugs and ignite the air-fuel mixture. Put two of these on an engine and two spark plugs per cylinder and you have a reliable and redundant ignition system that will keep you flying until you run out of gas or the magneto breaks. The magneto always fires its spark at the same point in the combustion cycle and for a short duration of only 5 degrees of engine rotation, so setting the timing, which is typically 25 degrees BTDC (before top dead center), is critical for proper engine starting and operation at low altitudes and high manifold pressures. The downside is that the fixed timing is a compromise that prevents optimized engine operation and efficient fuel consumption over a wide range of flight conditions. The result is that magneto-driven ignition systems waste fuel—which robs us of available power.

The electronic ignition system addresses all of the shortcomings of the magneto by monitoring the engine rpm and manifold pressure to deliver spark duration of 20 degrees of engine rotation through massive electrode spark plugs that together assure more complete burning of the fuel mixture for higher stored energy release into the engine. As conditions warrant, the engine timing is advanced by the EIS controller from 25 degrees BTDC up to a maximum of 40 degrees BTDC to assure that the power output is maximized, resulting in higher power at lower manifold pressures typically seen

Over the last several decades while the aircraft engine has languished with its fixed-timing magnetos, automobile manufacturers have become very good at extracting every bit of horsepower and fuel efficiency from powerplants, and it's time that the aircraft industry joined the 21st century.

in cruise flight and yielding lower fuel burn.

The installation of the EIS is straightforward as there are only three major components along with cabling and sensors. Only one magneto is removed as this maintains the redundancy of a dual ignition system, and since the EIS has a spark duration and timing that encompasses the spark duration and timing of the magneto, it is not only unnecessary to replace both magnetos but more complex as there is a requirement to install a second battery in the plane in case the alternator fails since unlike magnetos the EIS is not self-powered.

The electronic control module and MAP sensor mount on the passenger side of the firewall, and the coil pack mounts on the engine side. There is a timing ring that mounts around the crank just behind the prop flange, and an inductive sensor on a bracket bolts to the front of the engine case. Once all of the supplied wiring harnesses are run through the plane and connected, and new spark plugs and wires installed, the plane is ready to be fired up and impress the pilot.

The system has its own circuit breakers and an on-off toggle switch instead of being wired through the key switch per the manufacturer's installation manual. The run-up is slightly different in that you turn off the EIS to check the mag and immediately notice a 100 rpm drop and a rougher feel. When you switch the EIS back on, the engine smooths out and gets quieter. Turning off the mag at the key switch has virtually no rpm drop, and the engine continues to run smooth and quiet. Turning the magneto back on again yields little change to the quality of the engine operation, and this is the first sign that the plane is about to amaze you. *IAC*

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TECH TIPS

Reprinted from the International Aerobatics Club
Tech Tips Manual, volume IV

CRAIG VANDERKOLK

Special Tech Safety Report
Formation Flying

by Sam Burgess

Formation flying probably requires more concentration than any other phase when you consider the consequences of a moment's distraction.

"What has formation flying got to do with sport aerobatics?" some will counter. Well, it will make you a more disciplined and precise pilot and provide you with a better feel of your aircraft. As many aero pilots fly formation to and from contests, or for air-to-air photos, the following is a guide for the newcomer to this challenging part of the sport. There is nothing more satisfying than having flown a good wing or anything more humbling than when you first try.

The most important item of formation flying is a thorough briefing by the flight leader prior to takeoff. The old cliché of "kick the tire, light the fire and the first on the runway is lead" is pure fantasy and has no place in a sophisticated operation.

The flight leader should be the most experienced pilot but not necessarily the best formation pilot. This slot is usually reserved for the number two man as any over-controlling will be amplified in a large formation.

Radio and/or hand signals play an important part in a successful mission especially during instrument formations where vertigo sometimes will affect a pilot in turns. A night penetration flying in the number five position in a right echelon is an experience to remember.

Formation takeoffs can be safe if a few basic rules are observed. No more than a two-ship takeoff is a must. Most runways will not allow for any more anyway. Place the number two man on the upwind side in a crosswind to stay out of the leader's wash and allow enough spacing to clear the lead in case of an abort, blown tire, etc. The flight leader usually applies max power then retards the throttle slightly to allow number two to adjust for any slight variances in aircraft performance. It goes without saying that both aircraft must be similar enough in design and performance to make formation practical.

After takeoff the leader will execute a slow climbing turn to on course. In a right turn, for example, the number three man will slide under and to the rear of the number one and two, number four will form up on number two and number five will slide under and to the rear of number one and three aircraft, for a quickly formed "V" formation to on course.

During flight the leader usually signals changes in formation by rocking his wings to tighten up, walking the rudder to spread out, dipping his wing in the direction of changeover, pointing in the direction of turn and a forward and back hand motion to signal a throttle setting change.

As most aerobatic aircraft have some sort of sunburst these can be used to sight along to stay in formation which should be at least ahead of a 45-degree line drawn from the

fuselage of the lead where he can see you out of the corner of his eye. A good wing man will have a crick in his neck after a two-hour formation flight — not the lead.

Never, ever form up on another aircraft that happens to be flying alone in your same direction. Always fly formation wearing a parachute and don't make any sudden moves.

At the pre-World War II Cleveland Air Races, Claire Chennault used to do formation aerobatics with a flight of three P-12s — tied together with clotheslines with cloth streamers. I talked with his son a few years back on this stunt and his dad told him that the most difficult part of the entire act was trying to stay tied up taxiing on the rough sod — with a tail skid.

Crossover from a "V" formation to echelon has one firm rule. Always keep the lead and other aircraft in the formation in sight. This is usually accomplished by sliding under and to the rear of the lead. Stepping up or down in level flight will depend on the type of wing configuration (high, low or midwing) and will be covered in the flight leader's briefing.

When turning in formation the aircraft on the inside of the turn will drop down and reduce power while the outer aircraft climb slightly and apply more power. This maintains the same angular position in relation to the lead aircraft as in level flight.

A two-ship formation flight is ideal, three is tolerable, four is a chore and five or more is unwieldy. However, if properly briefed and each pilot follows instructions to the letter a large formation can be flown as smoothly as any. But for relaxed cross country formation flying, it is well to break up the entire flight into echelons of two.

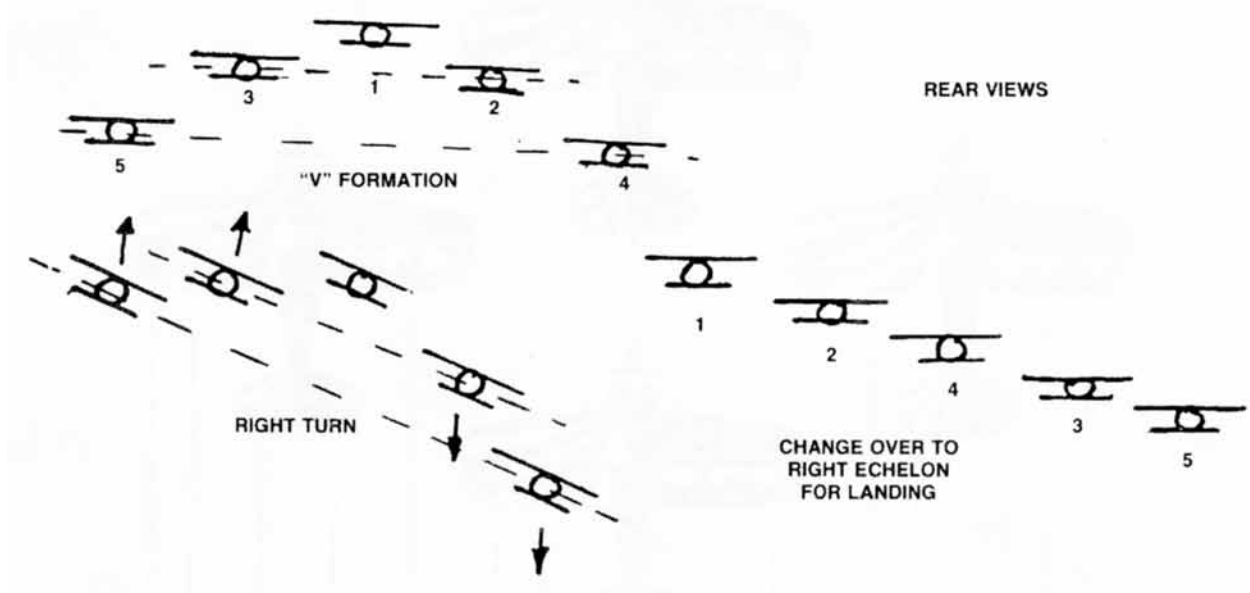
How close you fly to your leader will depend on his tolerance for the proximity of your talents, turbulence, weather, and your penchant for showing off. It is amazing how good a formation pilot you rapidly become when the weather closes in and you have lost your radio and artificial horizon. The number two man usually sets the spacing for other aircraft to follow to make the flight appear proportional.

Propeller driven aircraft, especially constant speed and turboprops, are very responsive in formation while jet aircraft are slow to accelerate and quick to overshoot your position. Speed brakes are an advantage.

The tightest formation I have ever seen from the lead position was with a flight of six P-39s. As the runway was in line with a right echelon for pitch out I looked out at the formation and saw only my number two man. "Where in . . . are those other four jocks?" But on closer look, they were flying in such a perfect echelon formation that the number two aircraft was almost completely blocking the others from view. It was a sight to remember.

A fingertip formation in a "V" will usually look like the accompanying sketch. It can be seen that this is also your number for takeoff for a quick form up. When changing over to a right echelon for a pitch out to the left for landing, the number three man will slide over first, then number five. The number of seconds to count for a 360-overhead will depend on the type of aircraft and length of runway. Four seconds will provide good separation. The lead will land to the left of centerline, number two to the right, number three to the left, etc. to provide a safety factor in case of a ground loop, blown tire, etc.

So, relax but stay alert at all times. Don't get a fixation by staring. Look away once in awhile — check your instruments, manage your fuel, check on other aircraft in the flight. Don't over-control and follow instructions! You will find that, as in any other sport, teamwork prevails. After landing, if you don't have a sore neck, a bit of the shakes, a numb posterior, a hitch in your back, red eyeballs, and a feeling like you just hit a basesloaded home run, then you have missed all the fun in formation flying. IAC



Maintenance

DEKEVIN THORNTON

Time to show your tail wheel some love

BY ANDREW BOYD

You've been flying your aerobatic airplane for a while this season. Time to show your tail wheel some love. In a wholesome way. If you have a floor jack and a 6-inch piece of 4-by-4 to put under the spring, it's a great idea to get just a little daylight between the tire and the ground. It's amazing what you will notice if you do that. You can do a better job of greasing, too, when there is no weight on it.

Get a quart of mineral spirits or Varsol and pour it into an old spray bottle that you've rinsed out. Use it and a rag and an old toothbrush to clean your tail wheel assembly.

Look at the tension on the horn springs. If they are slack, take out a link on each side.

Look at the four clips at each end of both horn springs. If they are opening up, give them a squeeze with a pair of pliers. I just had one let go on a homebuilt I was doing the initial tests on. Consider replacing them with the clips. They actually come with the official Maule compression spring kit from Spruce, unlike the el cheapo spring clips that come with the "no-name" compression spring kits. Note the hole in the screw barrel, to put a tiny cotter pin or 40 thousandths lock wire through. Also note the arrow on the right side, pointing to wear on the end of the clip—it is no longer serviceable. But I couldn't see that until I removed it.

Get out the grease gun, and pump some AeroShell

Get out the grease gun . . .

Grease 22 (or whatever) into the fittings. You do not want metal on metal. That's when stuff wears out. You need to lubricate it to avoid that.

On that subject, put a drop of oil on the AN3 bolts that connect the rudder cables to the rudder horn. It's a common place to get expensive wear. I use a spray bomb of CorrosionX for this. If you are incredibly cheap, take the dipstick out of your engine and use that instead.

If you don't have spring gear—and thus aren't worried about breaking your lower longerons—you have four bolts that connect your main landing gear to your airframe. Give them a squirt with CorrosionX, too. After flying, you should see annoying black stuff behind them. If you don't, you are going metal on metal, and it's going to be very expensive to repair that in the future.

Put a drop or two of silicone lube on your flight control hinges. You can get it at any automotive supply store. Again, no metal on metal. It doesn't cost much, or take much time, to avoid really expensive future repairs.

Oh yeah, the tail wheel tire. If it's pneumatic, check inflation to spec. Check for wear, especially asymmetric. If you don't have a spare tire on the shelf, order one.

If you fly a lot, consider keeping an entire tail wheel tire/tube/wheel/bearing assembly spare on the shelf. You can swap it out in two minutes. Freddy Cabanas taught me that trick. When he went to Quincy to drop jumpers, he would bring built-up spare main tire/tube/wheel/brakes for quick replacement. *IAC*

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TECH TIPS

Reprinted from the International Aerobatics Club
Tech Tips Manual, volume IV

Special Tech Safety Report
Metal Corrosion Lessons Learned

by editor Jean Sorg

What could have been a tragedy had a happy ending during Fond du Lac 88. Perhaps what contributed greatly to that end result was the fact a most experienced pilot was at the controls of the aircraft involved.

During the 4-Minute competition at the IAC International Aerobatic Championships in Fond du Lac, Wisconsin, Jim Rossi (the Unlimited champion at Fond du Lac 82 and a newly-elected IAC Director from Arlington, Texas) surprised judges and onlookers alike with a rather dazzling, seemingly rapidly executed square corner to inverted climb out — from an accelerating vertical downline. Shortly thereafter he landed without completing his routine. The reason? He had developed a very definite mechanical problem.

Currently without an aero mount of his own while in the process of building a monoplane, he was flying a borrowed aircraft, Tom Adams' Pitts S-1S. This Pitts, which had been successfully flown to the Advanced title at the last two Nationals by Adams, had suddenly acquired faulty tail feathers — something had obviously broken.

Ground inspection of the elevators, including the cutting away of the fabric, revealed complete disintegration of certain areas of the metal elevator ribs, nearer the trailing edge of the left elevator. Rust was the culprit and it was everywhere! As the accompanying pictures show, some areas of the remaining metal were severely pitted with holes while other areas had turned into a rust powder creating sizable gaps in the structure. The corrosive damage from moisture was so rampant it was amazing that the elevators' metal components hadn't failed long before this.

Questions addressed to Rossi, Adams and those others who helped replace the elevators in time for Adams' first flight the next day turned up some valuable lessons generated by the whole affair. The most important is all metal structural parts of our aerobatic aircraft should be protected with some sort of anticorrosive material. The second is drain holes in the elevators should be closely inspected for dirt and any signs of rust. The third is the fabric should probably be removed every four or five years to carefully monitor the conditions under it. The fourth is there is just nothing better than lots of experience coupled with enough altitude for recovery whenever something breaks while doing aerobatics.

Rossi's accounting of what transpired and his observations about the technical safety aspects is as follows:

"I opened the 4-Minute in Tom Adams' Pitts S-1S — 180 HP and spring gear which I had flown before — with an eight-point vertical roll. Then I let the airplane torque roll back down and entered a three-turn, inside spin. From there I went to the upwind edge of the box and did a modified Humpty with some rolls up and a snap on the radius. As I came over the top, I pitched down to vertical and my next maneuver would have been a lay-down eight.

"As the airplane started to accelerate on down the vertical line, it suddenly tucked under and my left hand instinctively came off the throttle and onto the stick. I had full force with both hands with the airplane continuing to tuck under. We figured it probably tucked under to the tune of about 5V2 to 8 G's negative. It didn't bother me physically and had I rolled upright which I instinctively started to do — the aircraft had a lot of speed at that point — it probably would have continued

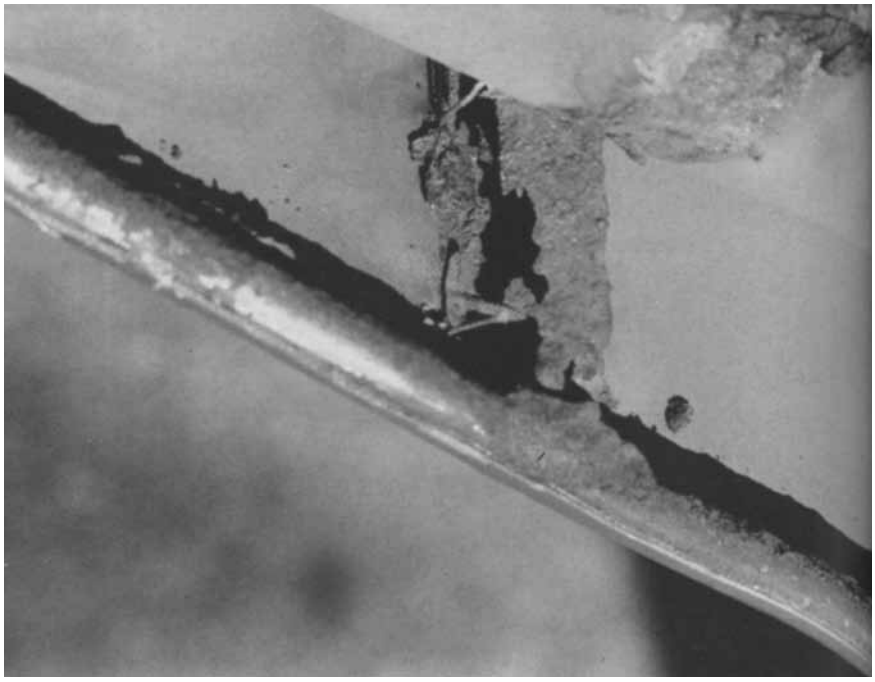
tucking right on down.

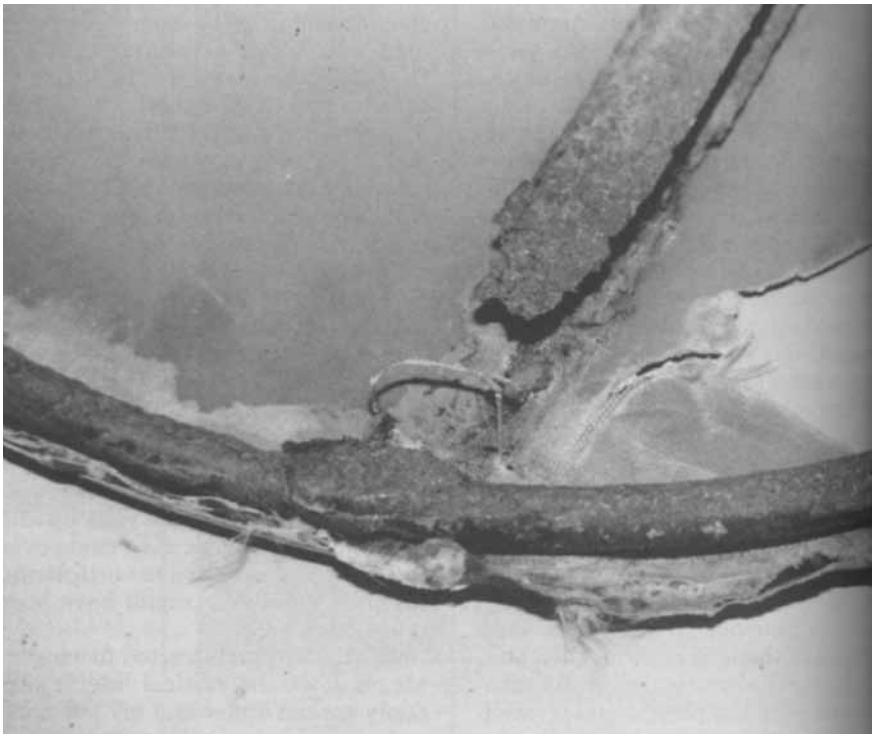
"But I knew in the back of my mind instantly — I've talked to other people who had had problems with the tail — that the stabilizer had probably let go since it was radiusing on an outside radius and coming up past the horizon. At this point I stayed with it and let the nose come up to an inverted climb. I was gaining altitude inverted so I hung onto the airplane and continued an inverted climb out of the box with the idea of getting some altitude to leave the airplane.

"It got up to about 2500 feet on the altimeter and with the airplane at about 110 indicated airspeed inverted, I rolled it upright very gently. At this point, the tail felt mushy, but I did have control. So I came on around, entered the downwind and landed.

"Upon landing we started looking at the airplane and you could see a noticeable deflection in the left elevator. In fact what it amounted to is we cut the fabric away. The airplane had been recovered seven years ago and originally did not have drain holes for moisture accumulation. Also evidently it was never corrosion-proofed properly and the ribs were totally eaten away with rust.

"The most inboard rib where it attaches to the tube that forms the shape of the tail had a good one inch of space between it and the rib. There was nothing there for holding. Obviously Tom had been practicing hard with the airplane with just a fraction of rusted metal holding the tail together and it just happened to let go at that particular moment when I was flying. It





Close-up photos show severe metal corrosion of elevator ribs on Tom Adams' aircraft, a Pitts S-1S.

had nothing to do with the maneuver I was doing.

"The reason it tucked under so abruptly, of course, was it was deflecting and acting like a giant trim tab. Even with the normal trim tab, if you have full throw on it, it takes quite a lot of pressure to override it and the tail was deflecting the more I pulled — as we figured out later. The more I pulled the more the tail was deflecting and in fact, it was a complete control reversal. I guess why it all came out with a happy ending was I hung onto it and let it continue right on around and eventually gained altitude.

"This is an area, the tail, that definitely needs to be checked. No matter how closely the airplanes are tech inspected, you can't see what's under the fabric. So it's probably a good reason even if everything looks okay to maybe take that fabric off every four or five years and see what's under there."

What altitude was Rossi at when the incident occurred?

"Well, I'm kind of guessing, Jean. I started pretty high on the opening figure. I was probably approximately 2,000 feet above the ground pointing down when the aircraft abruptly tucked. I was in good shape there. Fortunately I started high since I haven't been flying a lot lately."

What did it feel like?

"It was a very strange sensation. I've never experienced that in the Pitts. And, of course, you don't know what's happening back there. I knew it was a tail problem.

"Everything was normal up to the point where I hit the vertical downline and as the airplane started to accelerate and just a fraction before I would have pulled —as a matter of fact, it may have been that the pull is what precipitated it — to do a laydown eight is when it let go and started deflecting. It felt as if something had grabbed the controls and just took the airplane away from me. I had no control at all. It just instantly tucked under very abruptly.

"At that point I was in an inverted dive with the airplane accelerating. I then let go of the stick with my left hand to get the throttle off and as it was coming up on the speed I then let the airplane — I had plenty of altitude — radius on around while playing the throttle a little bit, just backing off enough to keep it from accelerating. Once the nose came up past the horizon I started adding power again so that I could keep the airplane in a climbing position inverted.

"Basically I'd say that when it happened I was just looking straight at the ground and the airplane then acted like it had a mind of its own and it just decided to tuck under. From the ground, observers said it was very obvious and that it was probably the most square corner I've ever turned in a Pitts."

Would he have been able to recover had he been any lower in altitude? "If I had done everything the same I guess technically I could probably have been another 900 feet lower and still not hit the ground, but I'm glad I wasn't (any lower)!"

Was it his experience that proved to be so beneficial in his handling of the situation? Could a more inexperienced aerobatic pilot, particularly an entry level one in say the Sportsman category, have recognized what to do and responded as quickly?

"Probably not," was Rossi's rapid reply. "I think that's where lots of experience in this sport is invaluable. When you've done this awhile, you don't react instinctively like you do at first in aerobatics. I think a first-timer or a newer competitor would have a natural instinct when you're pointed at the ground on a dive inverted to roll the airplane right side up. Had I done that the airplane would have continued to tuck in the opposite direction and it would have just kept tucking until I hit the ground.

"Instead the split second I realized I had no back elevator and was past the vertical point in the negative direction, I hung with the airplane since it was radiusing out and just hoped that it would continue to do so which it did. I think that there's no doubt about it that having flown these things awhile and having the experience I have, it all helped in the end. You just can't get too much experience.

"Someone who is not used to going outside would probably have instinctively rolled the airplane right side up. And, of course, his speed would have still been great, his back pressure would still have been on the elevator deflecting it and so every time he did that it would have simply kept tucking under on him. This is a good reason to get some outside experience with an instructor, even though you may still be flying Sportsman, to become at least comfortable with it if you have to go in that direction in an emergency."

Would the outcome also have

been affected by the weight of the pilot involved, particularly if the person was heavier?

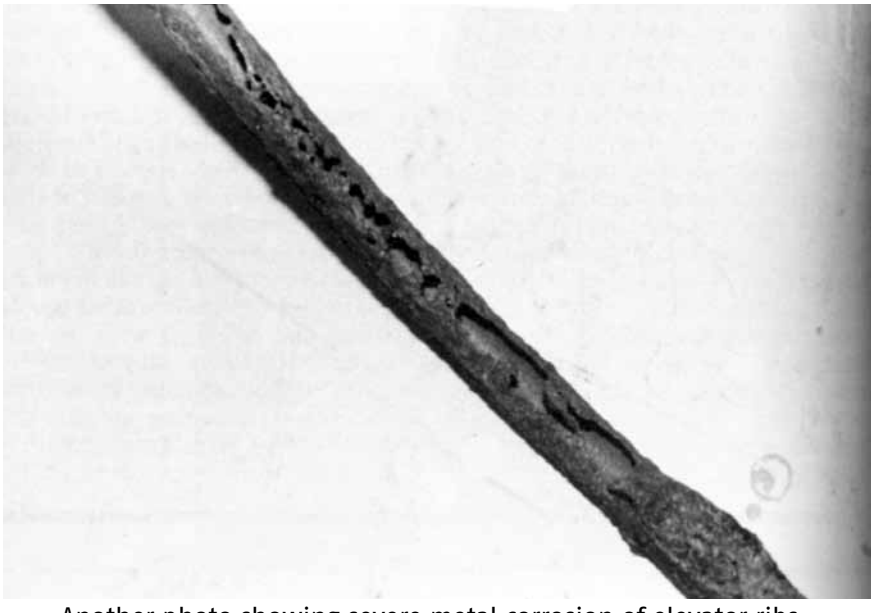
"It's hard to say. Tom (who is heavier than Rossi) might have been flying it in his aerobatic sequences and if the elevator had let go for him or even during my freestyle — say on an inside-outside eight at a lower altitude — we might have been in more trouble. If we had been pushing to begin with it would have reversed in the opposite direction. I was probably in the best possible position when it let go.

"As to whether Tom's weight would have affected it, I don't know. Of course, with a more aft CG, there could have been even more load on the tail with more weight in there and possibly more deflection. But it's just hard to speculate on that aspect of it, Jean. Like I said, I think that when it did happen, I was probably in the best position that one could be."

What advice would he give to help avoid such an incident in the first place, besides internal inspections with fabric removal every four or five years?

"Several of us were talking about this and we feel the problem started with a lack of proper corrosion protection. Most of the airplanes don't have it. As Bud Judy pointed out you really need to use a two-part epoxy primer."

Incidentally, Fred Cailey, our IAC Technical Safety Chairman and our magazine's associate editor regarding technical safety, shares this viewpoint. In fact, he stated, "Two-part epoxy primer is dynamite! It's really good."



Another photo showing severe metal corrosion of elevator ribs on Tom Adams' aircraft, a Pitts S-1S.

Rossi continued: "Before covering the aircraft, most people use a zinc chromate as a primer. But the problem is once you put dope on it, the dope lifts the zinc chromate right away and you end up with bare metal. That in combination with moisture collecting, especially if you don't have drain holes which evidently Tom's airplane didn't have for about five years or so, will just cause rust to form in there inside the fabric.

"My former airplane, a Pitts, was only four years old when I decided to tear it apart and recover it. As it turned out there was nothing wrong with it, but I think that with this kind of flying, it behooves us all to maybe do a recover job every four or five years — just to see what you've got in there.

"But remember to start with a good corrosion-proofing, using a two-part epoxy primer. Dope won't lift that off the metal once it's on. In fact, Bud Judy was telling me you can hardly sand it off; it's so tough. You've got to sandblast the metal, the fuselage, clean when you're building or recovering these things and then corrosionproof immediately before there's time for any rust at all. Good, solid, prevention measures are just plain necessary to begin with because the only way you could see those ribs in the first place would be to have some sort of inspection plates on the elevators."

Neither he nor Cailey particularly recommend such plates in that area either. Cailey wasn't sure what plates on the elevators themselves might do as far as affecting structural soundness, handling characteristics and aerodynamics. Maybe even flutter would develop he conjectured. But drain holes in the tail are absolutely essential they both stated and, of course, checking for drainage holes are

standard procedure in any technical monitoring at a contest and in anyone's preflight. Not only should there be holes, but they should also be clean — that means no rust or dirt. Without the holes, moisture, even from plain old humidity in places like Florida, can collect and do its damage. The best example of how severe the damage can be are the pictures of the rust-eaten elevator ribs in Adam's aircraft.

When it came to restoring his Pitts to acceptable flying condition for the contest, a few commented it couldn't be done in time. But those few hadn't figured on the amazing EAA and IAC can-do attitudes and cooperative spirits of members rallying to help each other out.

Bud Judy, who was at Fond du Lac 88 at the time of Rossi's elevator escapade and assisted in the inspection of the damaged tail areas, just happens to be the son-in-law of Paul Poberezny, EAA's President. He quickly volunteered the use of the EAA museum's full aircraft shop/repair/maintenance facilities.

Consequently, he and Adams headed there with the elevators along with Rossi and several of Adams' staunchest competitors in his category level, Advanced. They were Dick Blatter, who is highly experienced in building and recovering aero mounts and who is particularly adept at speedily doing such fabric work as rib stitching and the like, and Bruce Thalheimer, who although inexperienced as a homebuilder was full of the desire to lend a helping hand.

At EAA Adams received a bonus. Paul Poberezny himself did all the welding for the new elevators needed. And some of the EAA staff, including Bauken Nowak, pitched in as well. Nowak expertly and quickly bent and shaped the new metal for the trailing edges, etc.

Blatter handled all the covering and rib stitching while Adams, Rossi and Thalheimer did the doping and ironing. Blatter also quipped, "I'm not just doing this to help Tom out. I don't want him to have any excuses when I beat him."

The whole process which would normally have taken some people weeks to accomplish was done in a matter of hours. The assemblage arrived with the faulty elevators at EAA in Oshkosh, Wisconsin, approximately 20 miles north of the Fond du Lac contest airport, about 6:00 P.M. and left with the new ones about midnight. They were just temporary ones naturally and had no corrosion-proofing or paint on them, but they were flyable and safe to use to get Adams through both Fond du Lac and the Nationals this year. Then during the winter he would be having his entire aircraft recovered and painted, taking care that all metal areas were properly treated with a two-part epoxy primer for rust prevention.

The next morning, which was Monday, August 8th, and the traditional opening day for the competition rounds involving the regular contest flights at this event, saw Adams and his helpful crew of fellow competitors at work quite early installing his pink, temporary elevators. Since his category was the first up to fly that day, he was particularly delighted that Mother Nature delivered a short weather delay to allow full completion of the installation process and another tech check.

In all installation ended up eating away approximately two hours or so because the crew broke a wire on the trim tab which then had to be fixed. Some time was also gobbled up by having to retrieve nuts which inadvertently got dropped into the belly of the airplane.

Adams was nearly beside himself with gratitude for all the help he received. "It's just an indication to me that the spirit of EAA, the experimenters, is alive and well in the world today because everybody who helped are EAA and IAC members and all with the exception of Bruce are homebuilders. And the talent, skill and cooperation from Paul himself at the EAA and staffer Bauken were just amazing. Those two were phenomenal in how hard they worked and how fast and all on their personal time!" And Poberezny refused Adams's offer to pay for the use of the EAA facilities, materials and staff explaining that IACers are all part of the EAA family and that "we take care of each other and the facilities are here to help."

When asked, after his first flight, if his Pitts handled any differently with its elevator substitutions, Adams responded, "Yes. By differently I mean it pulls differently. There was an awful lot of paint on the tail of my airplane originally. So with the way it is now, the weight's changed a little bit and the airplane snap rolls a little differently. It takes a little more back pressure to get it to break for a snap roll is what I'm saying. It just feels different. It's not exactly like it was the day before it broke. I'll get used to it eventually." IAC

CONTEST CALENDAR

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

Kathy Jaffe Challenge
Friday, August 9 - Sunday, August 11, 2013
Practice/Registration: Thursday, August 8 - Friday, August 9
Power: Primary through Unlimited
Location: South Jersey Regional Airport (VAY), Mt. Laurel, NJ
Region: Northeast
Contest Director: Mark Mattioli
Contact Information: Primary Phone: 609-634-0327
E-Mail: *ce2n6gk@gmail.com*
Website: *www.iac52.org*

Hoosier Hoedown
Saturday, August 10 - Sunday, August 11, 2013
Practice/Registration: Friday, August 9
Power: Primary through Unlimited
Location: Kokomo Municipal Airport (OKK), Kokomo, Indiana
Region: Mid-America
Contest Director: Mike Wild
Contact Information: Primary Phone: 765-860-3231
E-Mail: *mike.wild@hotmail.com*
Website: *www.hoosierhammerheads.com*

Doug Yost Challenge
Saturday, August 17 - Sunday, August 18, 2013
Practice/Registration: Thursday, August 15 - Friday, August 16
Power: Primary through Unlimited
Location: Spencer Municipal Airport (SPW), Spencer, IA
Region: Mid-America
Contest Director: Aaron McCartan
Contact Information: Primary Phone: 515-570-3537
E-Mail: *northernplanes@outlook.com*
Website: *www.iac78.org*

Beaver State Aerobatic Contest
Friday, August 23 - Saturday, August 24, 2013
Practice/Registration: Thursday, August 22
Rain/Weather: Sunday, August 25
Power: Primary through Unlimited
Location: Eastern Oregon Regional Airport (PDT), Pendleton, OR
Region: Northwest
Contest Director: John Smutny
Contact Information: Primary Phone: 206.399.7097
E-Mail: *johnsmutny@gmail.com*
Website: *http://www.iac77.eaachapter.org/*

2013 Upper Canada Open
Saturday, August 24 - Sunday, August 25, 2013
Practice/Registration: Friday, August 23
Power: Primary through Unlimited
Location: Chatham Kent Municipal Airport (CNZ3), Chatham ON, Canada
Region: Mid-America
Website: *http://aerobaticscanadachapter3.blogspot.com*

Oshkosh 2013
Saturday, August 24 - Sunday, August 25, 2013
Power: Primary through Unlimited
Location: Wittman Regional Airport (OSH), Oshkosh, WI
Region: Mid-America
Contest Director: Audra Hoy
Contact Information: Primary Phone: 920-203-9000
E-Mail: *audra_hoy@yahoo.com*

Happiness is Delano
Saturday, August 31 - Sunday, September 1, 2013
Practice/Registration: Friday, August 30
Power: Primary through Unlimited
Location: Delano Municipal Airport (DLO), Delano, CA
Region: Southwest
Contest Director: Stephen De La Cruz
Contact Information: Alternate Phone: 760-963-6426
E-Mail: *sec@iacchapter26.org*
Website: *www.iacchapter26.org*

Hammer Fest
Saturday, August 31 - Sunday, September 1, 2013
Practice/Registration: Friday, August 30
Rain/Weather: Monday, September 2
Power: Primary through Unlimited
Location: Llano Municipal Airport (AQO), Llano, Texas
Region: South Central
Contest Director: Mike Carver
Contact Information: Primary Phone: 360-888-7604
E-Mail: *mngcarver@comcast.net*
Website: *iac107.org*

Canadian Western Aerobatic Championships
Friday, September 6 - Saturday, September 7, 2013
Practice/Registration: Thursday, September 5
Rain/Weather: Sunday, September 8
Power: Primary through Unlimited
Location: Rocky Mountain House Airport (YRM): Rocky Mountain House, Alberta
Region: Northwest
Contest Director: Dave Barbet
Contact Information: Primary Phone: (403) 875-3467
E-Mail: *dbarbet@telus.net*
Website: *www.aerobaticscanada.org*

Ace's High Aerobatic Contest
Saturday, September 7 - Sunday, September 8, 2013
Practice/Registration: Friday, September 6
Power: Primary through Unlimited
Location: Newton City Airport (EWK), Newton, Kansas
Region: South Central
Contest Director: Ross Schoneboom
Contact Information: Primary Phone: 316-648-5057
E-Mail: *schoneboomr@prodigy.net*
Website: *www.iac119.webs.com/*

East Coast Aerobatic Contest
Saturday, September 7 - Sunday, September 8, 2013
Practice/Registration: Friday, September 6
Power: Primary through Unlimited
Location: Warrenton-Fauquier Airport (HWY), Midland, VA
Region: Northeast
Contest Director: Scott Francis
Contact Information: Primary Phone: 703-618-4132
E-Mail: *s.francis@ieee.org*

NorAm Team Championship
Friday, September 13 – Saturday, September 14, 2013
Practice/Registration: Thursday, September 12
Rain/Weather: Sunday, September 15
Power: Primary through Unlimited
Location: Ephrata Municipal Airport (EPH), Ephrata, WA
Region: Northwest
Contest Director: Jerry Riedinger and Emma Stewart
Contact Information: Primary Phone: 425-985-9469
E-Mail: *JRiedinger@perkinscoie.com*
Website: *http://www.iac67.org/*

Rocky Mountain "Oyster" Invitational
Saturday, September 14 – Sunday, September 15, 2013
Practice/Registration: Friday, September 13
Gliders Categories: Sportsman Intermediate
Power: Primary through Unlimited
Location: Lamar Municipal Airport (KLAA), Lamar, Colorado
Region: South Central
Contest Director: Jamie S. treat
Contact Information: Primary Phone: 303-304-7937
E-Mail: *JamieTreat@q.com*
Website: *http://www.iac5.org*

2013 US National Aerobatic Championship
Sunday, September 22 – Friday, September 27, 2013
Practice/Registration: Saturday, September 21
Rain/Weather: Saturday, September 28
Glider Categories: Sportsman through Unlimited
Power: Primary through Unlimited
Location: North Texas Regional Airport (KGYI), Sherman, TX
Region: Mid-America
Contest Director: John Smutny
Contact Information: Primary Phone: 206-399-7097
E-Mail: *usnationalscd@gmail.com*
Website: *http://nationals.iac.org/*

27th FAI World Aerobatic Championships
Wednesday, October 9 – Sunday, October 20, 2013
Practice/Registration: Tuesday, October 1 – Tuesday, October 8
Power Categories: Unlimited
Location: North Texas Regional (GYI), Sherman, TX
Region: South Central
Contest Director: Chris Rudd
Contact Information: Primary Phone: 850-766-3756
E-Mail: *waccd2013@gmail.com*
Website: *wac2013.com*

Sebring Aerobatic Championships
Friday, November 1 – Saturday, November 2, 2013
Practice/Registration: Saturday, October 26 – Thursday, October 31
Power: Primary through Unlimited
Location: Sebring regional (SEF), Sebring,FL.
Region: Southeast
Contest Director: mike mays
Contact Information: Primary Phone: 561-313-8503
E-Mail: *soaerobatics@aol.com*
Website: *www.iac23.com*

Tequila Cup
Friday, November 8 – Saturday, November 9, 2013
Practice/Registration: Thursday, November 7
Glider Categories: Sportsman through Unlimited
Power: Primary through Unlimited
Location: Marana Northwest Regional Airport (AVQ), Marana, AZ
Region: Southwest
Contest Director: Jim Ward
Contact Information: Primary Phone: 603-860-4456
E-Mail: *cd@tequilacup.org*
Website: *www.tequilacup.org*

ADVERTISING INDEX

BY GARY DEBAUN, IAC #4145

Guenther Eichhorn

GD: Guenther, you have been around this sport a long time; can you tell us how you got started?

GE: I got my pilot's license in 1978. Right away I was interested in aerobatics. I did some basic stuff in a Citabria at that time. Over the years I took lessons here and there, mostly in Citabrias and Decathlons. In 1986 I went to St. Augustine, Florida, and took a ride with Jim Holland in his Pitts S-2B. During that first flight in a Pitts I knew that this was the plane I wanted. In 1988 I bought my S-2A, and we have been together, flying contests, since then.

GD: Your Pitts S-2A fascinated me at the Apple Valley contest; she looks, well . . . uh . . . aged? I know you have had her about 25 years and have flown her all the way to the Unlimited ranks. Tell us about her.

GE: We have been together for 25 years now. I bought her in September 1988 through Jim Moser in St. Augustine. I lived in Gainesville, Florida, at the time. By 1990, the dope started to come off in a lot of places. For a while I patched things up, but by 1993 I decided to have the plane re-covered. In 2007 I started having problems with the engine. During and after takeoff the engine would run rough. About a minute after takeoff, it would smooth out and everything was fine. We worked on that for over a year, but never figured out what the problem was. I ended up getting a Barrett-overhauled engine in 2008. The fabric and metal paint is now showing its age again, so I have to start thinking about recovering her again.

I indeed flew Unlimited in the S-2A in 1999 and was Unlimited Northeast Aerobatics Champion. Flying Unlimited in the S-2A for a year taught me the most about precision flying. I had to learn to fly the plane extremely smoothly and accurately in order to have enough energy for the Unlimited maneuvers. It was quite a challenge, and I loved it.

GD: If you could have any aerobatic aircraft out there today, which one would you choose and why?

GE: I am a biplane guy. I don't want any of the newfangled planes. An S-2C would be nice; it would get me back into flying Advanced.

GD: When did you fly your first contest? Can you even remember back that far?

GE: I flew my first contest in January 1989 in Homestead, Florida, the "Last Aresti Contest," in Sportsman in my S-2A, shortly after I bought it.

GD: What is the most significant change you have seen in the IAC over the years?

GE: Too much concentration on the upper categories and category creep. In 1999 I was Northeast Aerobatic Champion in Unlimited; now I can't fly Advanced anymore because there are essentially always maneuvers in the Unknown that the S-2A can't fly.

GD: If you could change anything about the IAC, what would it be?

GE: Concentrate more on the lower categories, get more beginners into competition.

GD: I have to tell you, that guy in the "I don't always drink" commercials has nothing on you. I find you to be one of the most fascinating persons I have ever met. Tell us about some of your travels over the last few years.

GE: Do you have another couple of pages? In April I visited Easter Island, a place that I already wanted to see when I was a kid. It was fascinating to learn the history of that island. Last November I visited Nepal and Bhutan. The Hindu temples in Nepal and the Buddhist temples in Bhutan were fascinating. Last year in February I took a tour through Ghana, Togo, and Benin, which was very interesting. I found the voodoo religion in Benin especially interesting. In the fall of 2011 I visited Borneo, which was also a childhood dream. The wildlife there is fantastic. I even got to see the very rare pygmy elephants, the proboscis monkeys, and of course orangutans. In February 2010 I visited Burkina Faso, Mali, and Senegal. On that trip I visited Timbuktu, yet another childhood dream. One of my more notable trips was six weeks in Antarctica. It included a landing in a ski-equipped C-130 Hercules on the polar plateau at 12,000 feet altitude, with a takeoff run of 15 miles.

GD: What other interests do you have besides aerobatics and travel?

GE: I like programming, which comes in handy when I build my websites for my travel pictures. I developed programs to handle all that automatically, building the pages, etc. I run all that on my own servers.

GD: Guenther, what is your connection with the Acro Exploder?

GE: I started the Exploder in 1994, just after the WWW got started. At that time it ran on a server at the Harvard-Smithsonian Astrophysical Observatory. When they told me that I could no longer run it there, I found somebody else to run it for a few years. It moved to a few different places over the years. When I started running my own server in 2003, I moved the Exploder to my server, and it has been running there since then.

GD: Do you have a favorite contest?

GE: It used to be Fond du Lac. Right now I don't know the contests on the West Coast, so I don't have any favorites.

GD: Last question, since you are an astronomer, are we going to get hit by any asteroids in the near future?

GE: Depends on how you define near future. If you look at it from a cosmic perspective, "near" means the next million years or so, and the answer is "yes, certainly." If you look at it from a human perspective, then "near" means 100 years or so, and the answer is "maybe." We haven't found all the dangerous ones yet, but we are working on it. The chances are pretty low for a big hit in the very near future, but the results of such a hit are potentially so disastrous that we really need to do everything to try to prevent it if possible.

IAC 14967
Occupation: Astronomer
Chapter Affiliation: 35, 69
Age: 67
E-mail: *gei@aerobaticsweb.org*

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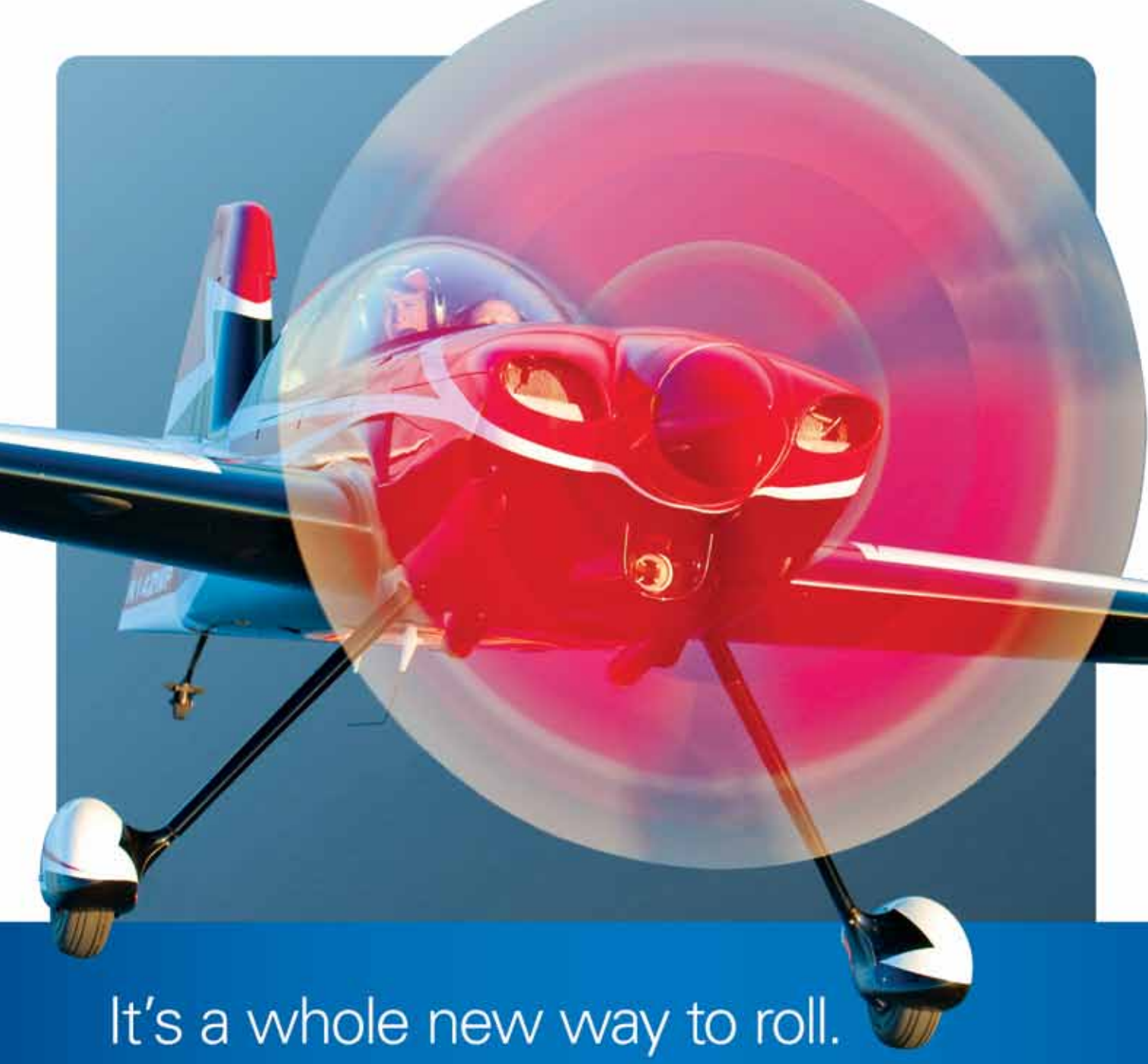

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