JULY 2008

SPORT Aerobatics

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- Teaching Instructors the Basics
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The late Eric Beard in the Yak 54 formerly known as *Russian Thunder.*

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2008 U.S. Advanced Aerobatic Team

Michael Steveson, *Team Manager*

The U. S. Advanced Aerobatic Team has high hopes of winning gold medals in the upcoming 8th Advanced World Aerobatic Championship (AWAC) taking place next month in Pendleton, Oregon. Returning team members Jeff Boerboon, Rob Holland, Todd Whitmer, and Hector Ramirez were members of the successful team that competed in Poland in 2006. With the experience gained in international competition as well as home-field advantage, this year's team will be hard to beat.

The 2006 U.S. team took second place in the team competition, finishing with a silver medal in Poland. This was due in part to the individual efforts of Rob Holland, Jeff Boerboon, and Hector Ramirez. Rob flew well enough to earn the overall individual silver medal. Jeff took the bronze medal in the freestyle flight, and Hector helped to anchor the team with a solid fourth-place finish in the freestyle flight and a fifth-place finish overall.

This will be the first appearance on the team for Norm DeWitt, Patrick Clark, Brian Dierks, Craig Dobesh, and Alex Land. All earned a spot on the team at the U.S. National Aerobatic Championships last September in Denison, Texas. Norm DeWitt brings an immense amount of knowledge and international contest experience as the president of Unlimited Aerobatics USA. Patrick Clark, Craig Dobesh, and Brian Dierks all hail from the great state of Texas. Patrick Clark was a member of the team that competed in Germany in 2000. Craig Dobesh has more than 14 years of aerobatic experience. This will be Craig's first international competition in the plane he built. Brian Dierks is 19 years old, and flying aerobatics at the world level has been a lifelong goal for him. Alex Land is the team's first alternate, and he will be ready to step in if needed.

The entire team has been practicing hard and focusing its attention on the 8th AWAC. Each team member will spend thousands of dollars representing the United States in the quest for team gold. An organization has been set up to raise funds to help defray some of the costs. Any and all donation amounts are welcome and are tax-deductible. Donations may be designated for a specific team member or for use by the entire team. With your support the chances of the U.S. team bringing home gold are greatly increased. To make a donation as well as to learn more about the U.S. Advanced Aerobatic Team, please visit *www.AdvancedAerobaticTeam.com*.

Volunteers are still needed for the AWAC. If you'd like to volunteer for the entire event or just a few days, please contact Lorrie Penner, the co-Volunteer Coordinator, *penn.lorrie@yahoo.com* or 513-284-5076.

PRESIDENT'S PAGE

by Vicki Cruse • IAC 22968
E-mail: vcruse@earthlink.net

The Power of Aerobatics

It makes people do the strangest things

When you decide to take that first step toward aerobatics, you never know where it might lead. For some, the introduction came through a ride with a friend, while others sought out an introductory flight at a flight school or spent a day at an air show. Then again, it could have been through a Daiquiri Whacker, a popular device that seems to be popping up at contests. Whatever the introduction, it had an impact, whether positive (the purchase of your own plane) or negative (as experienced through the use of a Sic-Sac and a promise to never deviate from straight-and-level again).

For those of us for whom aerobatics has become a semi-major part of our lives, it brings with it what we might call interesting "circumstances, values, and other oddities." For instance, why else would one buy a case of Pledge at Costco or Sam's Club? Pilots of aerobatic airplanes (not to condemn non-aerobatic airplanes) tend to keep their airplanes looking really sharp and clean, the one noted exception was a Yak-55 flown to Paso Robles one year by Wes S. (you know who you are), who decided to "decorate" it with multiple colors (including neon) shot from a spray can, with the idea that it would be fun since the plane was going to be repainted. It was "interesting" to say the least, and further solidified the idea that the judges see a silhouette, not necessarily a paint scheme, as there wasn't a single straight line on this one. It is highly likely there are more cleaning products in your hangar than in your house, though you won't admit it.

We are willing to spend major bucks on avgas, entry fees, hotel rooms, rental cars, food, and beverages in order to go to a competition and hang with our friends and fly aerobatics for three days. We can easily justify $5 per gallon for avgas, but buying that $75 Tommy Bahama shirt just doesn't cut it. If it weren't for Rich Stowell and his Emergency Maneuver Training Course, I'd probably be a lot unhappier with life, but I'd have thousands of dollars more than I do today. I'm not the only one Rich has given this "disease" to. It's time to spend a little of your kid's inheritance; you earned it, you can spend it.

Flying also gives us an opportunity to request "interesting" gifts for Christmas and birthdays, like a GPS with XM Satellite weather, fine-wire spark plugs, an electronic ignition system, and my all-time favorite gift—a torque wrench. The look on the gift giver's face was priceless when I asked for that one. No more neckties, balloons, or romantic comedy DVDs. No, we want a gift certificate from Aircraft Spruce & Specialty or Air BP.

The inspiration for this column actually came from the Ephrata, Washington, contest this past May where Noel Jones of McMinnville, Oregon, pulled me aside at the luau (yes, they have them in Washington, complete with a Daiquiri Whacker) to show me his latest achievement. Noel doesn't own an airplane; he was dragged to the Pendleton contest two years ago by Robert Harris, neighbor in McMinnville, and has been hooked ever since. Now he flies a Yak-52 in Sportsman. This man is totally in love with the Yak, so much so he recently let his love be permanently etched on his upper arm. Noel tells me he was even sober when it happened. Anyone else out there have an aerobatic-inspired tattoo?

So some might think this group is a half-a-bubble left of plumb, but for those of us who have been in the sport for 10-years plus, down to those who just joined IAC, we all have something in common. We love flying, and we love challenging ourselves. We are better-than-average pilots because we chose to go beyond the ordinary and learn every facet of our planes in every realm of flight. We are adamant about sharing that with others through rides (no Sic-Sacs, please), coaching, and even through the Red Bull Air Races. The "strangest" thing to come from all of this has been getting to know a diverse group of people who have a common, devout interest and knowing they will be friends for life.

NEWSBRIEFS

Two Earn Aerobatic Instructor Designations

The National Association of Flight Instructors (NAFI) and the International Aerobatic Club (IAC) are proud to announce a significant accomplishment on the part of John Gardner Dye of Lisbon, Ohio, and Klayton Kirkland, an instructor with Rihn & Harvey Aviation in La Porte, Texas. Dye and Kirkland recently earned their aerobatic instructor accreditation under a voluntary program developed jointly by NAFI and the IAC. In addition to the Master CFI-Aerobatic (MCFI-A) designation launched in 2001, two new tiers were added in the latter part of 2007: the Flight Instructor-Aerobatic (FI-A) and the Certificated Flight Instructor-Aerobatic (CFI-A) designations. While 11 instructors currently hold the MCFI-A status, Dye is the second, and Kirkland the third, aerobatic instructor to earn CFI-A status under the expanded program.

NAFI and IAC—both parts of the EAA—are dedicated to providing support and recognition for America's professional aerobatic instructors, while simultaneously encouraging all such instructors to rise up to and maintain a high level of professionalism. NAFI and IAC are also committed to providing a safe and effective learning environment for those seeking spin, emergency maneuver/upset, or traditional aerobatic training services. For more information on the Aerobatic Instructor Designation program, visit *www.IAC.org/programs/designation.html*.

Klayton Kirkland


John Dye

Dave Lucas, Prize-Winning Acro Sport II Builder, Lost in Crash

On Sunday, June 2, 2008, Dave Lucas lost his life in the crash of his Acro Sport II, N114KT. No official cause of the crash has been given. Dave was a long-time member of the Acro Sport community. He began construction of his Acro Sport II in 1994 and in 2006 flew it to Oshkosh. His meticulous approach to homebuilding paid off with numerous awards for craftsmanship on N114KT, including the 2006 Grand Champion Acro Sport II and the Designer''s Award presented by Paul Poberezny. Dave, his wife, Katie, and his Acro II were featured in the cover story of *Sport Aerobatics*, in September 2006. He was always generous with his knowledge when it came to questions from other builders, having been in the same position himself in years past. Condolences may be sent to Katie Lucas, 15099 Isleview Drive, Chesterfield, Missouri 63017. Katie requests donations in Dave Lucas' memory be made to EAA's Young Eagles program *www.eaa.org/youngeagles* or the Sierra Club *www.sierraclub.org*.

Longer Parachute Repacks Will Happen by February 20, 2009

Silver Parachute Sales & Service in conjunction with the Parachute Industry Association (PIA) spearheaded a multi-organizational project to extend the repack cycle of emergency parachutes from 120 days to 180 days. This has been a three-year project that Allen Silver and his son, Darrin, worked on for PIA and the many other interested organizations.

According to sources in the FAA, it is now in the final stages of being turned into law and will happen on or before February 20, 2009. It should be noted that under this new regulation, existing repacks will not be automatically extended. The new 180-day repack cycle will take effect only after the next repack that is performed by a certificated parachute rigger.

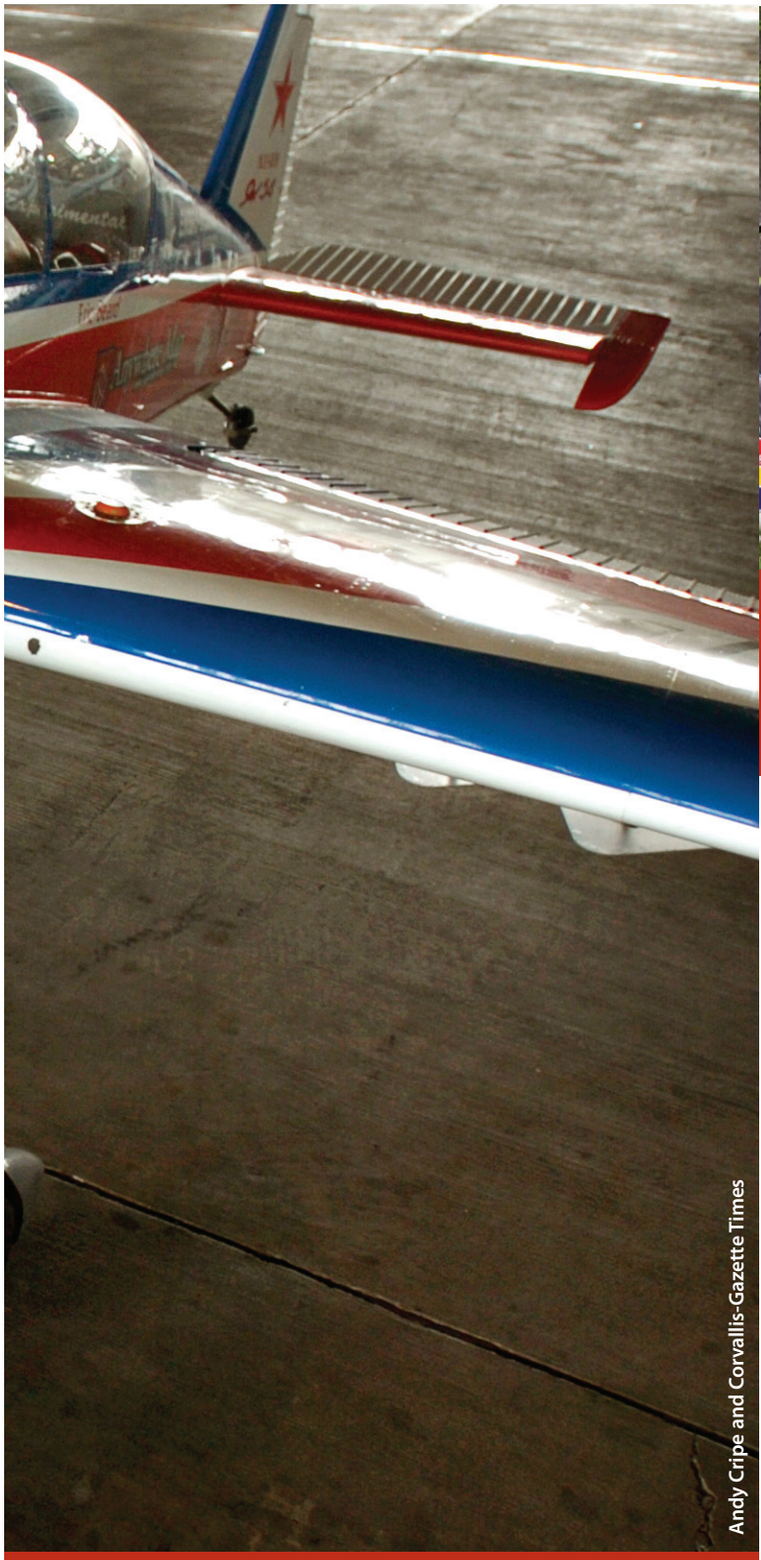
Thank you to all the organizations that supported this important issue. For additional information on the 180-day repack cycle, contact Allen Silver, *Allen@SilverParachutes.com* or 510-785-7070.

Aerobatic Practice Waivers and SSNs

If you are at all concerned about listing your social security number on an aerobatic practice waiver, you might wish to make the change over to an FAA-issued certificate number instead. Most practice waivers require pilots to list their certificate number, which for many is still your social security number. If you'd like to request a different pilot certificate number from the FAA, please visit *www.FAA.gov/licenses_certificates/airmen_certification/change_certificate_number*.

Jim and his Yak 54, formerly known as Russian Thunder

GOING "FULL



Andy Cripe and Corvallis-Gazette Times

Eric Olsen and Chris McVey

The real thing versus radio-controlled

SCALE”

Jim Bourke

I got my private pilot certificate 18 years ago, but like many new pilots, I found myself in a “Now what?” situation. I couldn’t afford a plane of my own, I couldn’t afford the fuel if I could afford the plane, and I didn’t really have anywhere to go anyway! I wasn’t looking for a job in the aviation industry, so I didn’t need to grind away hours toward some larger goal. I wanted a certificate so I could have fun!

To me, fun meant aerobatics. But moving from a Cessna 172 at the local fixed-base operator into an aerobatic plane seemed like a step I’d never be ready for. I finally gave up halfway through my instrument training and joined the Air Force. I hoped to stay close to airplanes, but soon found myself in front of a computer. The skills I learned there, essentially trapped underground writing programs in a secure facility, helped me create a career for myself in the software industry. I put my dreams of flight aside and pursued other endeavors.

Jim with the RC version of Matt Chapman's CAP 232

Eric Olsen and Chris McVey

Jim and some of his many RC planes.

But I had a lot of aviation fantasies to work out during all those flightless summers. I found myself interested in, attracted to, and eventually downright obsessed with radio-controlled (RC) planes. Actually, to date I've "invested" enough money in RC planes to buy at least a couple of Super Decathlons. I've also started a few RC-related businesses (*www.RCGroups.com* is one), and I've taken a full-time job as the general manager of a company in the RC industry (Knife Edge Software, developers of the RealFlight R/C Simulator). Some of my business efforts, like my models, have been successes. Some have crashed and burned. But through it all I've learned a little, and get to do what I love.

RC was a great way to experiment with all sorts of aircraft. Some of those were scale designs, while others were novel designs of my own. Some were sedate; others were hair-raising. I learned a lot about aerodynamics, power systems, and piloting by trial and error. I've gained thousands of hours of RC flight time, and I've met all kinds of neat people who, just like me, think airplanes are cool. It's been time well-spent.

But sometime last year I realized that I was really missing the real thing; what RCers call "full scale" airplanes.

BUYING A FULL-SCALE PLANE

So I decided to buy a plane. Probably everyone reading this has either passed through this part of the journey or is now within its throes. I'm the sort who can't buy a new TV without comparison shopping for months. This decision wasn't like picking up a new RC model; I knew I would live with my airplane for a long time.

I considered my goals and came up with a long list, but in the end I realized that they were all centered around one thing: I wanted to have fun. I wanted to be able to push a throttle level forward, feel *g*'s pushing me back into the seat, point the nose of my plane into the air, and feel the rush of a 3,000-plus fpm climb rate. I wanted to roll, loop, and spin.

It's interesting that a plane that never really developed a strong following in "real" aviation has found such popularity with modelers.

I also want to compete in International Aerobatic Club (IAC) competition, because I think it will be fun. I want to fly at air shows, because I think it will be fun. And maybe even race someday, because I think it will be fun. I know it will never stop being fun, because there are always going to be new angles to consider, new ground to break, and new goals to achieve.

So I decided right off that if I needed a trainer, I would rent it. But when it came time to buy a plane, I would buy something that I couldn't wait to fly every day. I

need to live out my little dream of flying aerobatics. Life is short and the time to do what you love is now. So I set out to find something that would let me fulfill the dreams I've always had as an RC pilot.

What RCers really seem to love is the Unlimited aerobatic planes. There are a lot of Extra 300Ls at an RC fly-in, as well as lots of Sukhois. One plane that has really developed prominence is the Yak-54. It's quite interesting that a plane that never really developed a strong following in "real" aviation has found such popularity with modelers. But I think that is because modelers have an eye for what looks good, and the Yak-54 is really a nice-looking aircraft. Its lines remind me slightly of the Hall *Bulldog*, my absolute favorite of all the 1930s racers.

RUSSIAN THUNDER

The sad passing of Eric Beard made his Yak-54, *Russian Thunder*, available. It didn't take long to decide that it was right for me. We used Eric's plane on the box of the RealFlight simulator, and I had spent many hours tweaking the physics to make it as realistic as possible. I also knew Eric a bit and felt a close connection to the airplane after his passing. I knew this opportunity wouldn't come up again: *Russian Thunder* is the only Yak-54 in the United States, so I jumped at the opportunity to purchase it last year and ever since have been working like crazy to get up to speed on my new vocation.

I had a few hurdles to jump through. Luckily, Ryan Birr of Northwest Insurance Group came to the rescue on my insurance needs. I couldn't find anyone else willing to work with a low-time pilot like me. Ryan explained that my extensive RC experience might be seen as a plus by an underwriter. No other insurance carrier looked at me as an individual willing to do what it took to learn, but instead I was viewed as a guy with no flight time. I must say that without Ryan's help, I would not have been able to proceed with my dream of owning a Yak-54. I'm happy to hear that Northwest Insurance Group is now a partner of the IAC.

Of course, getting insured wasn't as easy as signing a piece of paper; I needed some training. For that, I employed Steve Wolf and Rich Stowell. I couldn't ask for two better people to work with. I put in about 30 hours of training before I soloed my plane, and it has really paid off. I plan to continue to work with them in the future as I progress and hopefully absorb what they've tried to drill into me.

At this point, I feel comfortable practicing all the moves involved in the Primary and Sportsman sequences. I hope to have entered my first competition by the time you read this. I'm not a very competitive person, so don't look for me to place very high or push the envelope in some special way. I just hope to meet interesting people and learn all I can about the safe, precise, enjoyable potential of my plane.

RELEARNING AEROBATICS from the INSIDE

Since I have a lot of RC experience, and some form of notoriety within the RC community, I'm often asked how much of what I learned from RC has been applicable to what I am learning now. I think there are a lot of RCers who would really like to take the plunge into IAC-capable aircraft, but who just don't understand how accessible it is. They think, as I once did, that it just isn't the kind of thing a mortal could accomplish.

As you can imagine, there are probably some IACers who wouldn't exactly feel comfortable flying a $10,000 giant-scale RC model around the patch, either!

Actually, for people of nominal intelligence and physical capacity, both endeavors are perfectly approachable with training. I plan to do what I can to bridge the gap between these disciplines, because I think we can all learn a lot from each other.

I've found that my RC experience has been very helpful as I've approached aerobatics in my Yak. Since RC is my profession, I have a deep understanding of how an airplane (or at least a model of one) should be controlled during aerobatics, but there are also a number of things I've had to unlearn.

The RealFlight simulation of a Yak 54 . . .

. . . and the RealFlight simulation of an Extra 300L.

PROS

RC taught me the maneuvers, the proper names for them, the Aresti symbols, and the basic control inputs required to perform them. RCers use IAC sequences in their competitions, so I was familiar with those before I got into the cockpit for my first aerobatic lesson.

When I make a mistake, I'm aware of what it takes to recover. After logging literally thousands of hours of RC time, I've found that I can trust my instincts.

RC has taught me good spatial skills. I've had my mind turned inside out during full-scale aerobatics a few times, but I think it is a lot easier for me than most people because of my RC experience.

CONS

RC did not prepare me at all for the physiological realities of aerobatics. Nausea and dizziness were reactions I flat out was not prepared for, and they hit me much harder than I expected. I lacked an appreciation for what is going on inside the cockpit during a routine, and I think RCers in general are in for a shock when they experience life on the inside of an aerobatic plane for the first time.

RC airplanes have tremendous control authority and power-to-weight ratio. I knew this going in, but I was surprised at how different the control inputs were, how coupled the aircraft's rotations were, and how much finesse was required. Of course, my Yak-54 flies a lot more like an RC plane than the Super Decathlon I first flew with Rich. But even so, I am still trying to unlearn some bad habits I developed from overpowered and overcontrollable RC planes.

My feet are frozen! I've been using my left thumb for rudder for so long that it is really hard to wake up my feet. They only seem to want to work when I stick out my tongue and cross my eyes. If I could use my left hand to control the throttle and rudder, all my slow rolls would be perfect, or at least that's what I'm going to tell the judges.

INTERESTED in RC?

If you just want to check in and see what is going on in the RC community, I highly recommend two of my sites: *www.RCGroups.com* and *www.FlyingGiants.com*. Either one will get you way more information than you can digest in one lifetime.

When it comes time to learn how to fly RC, I highly recommend the RealFlight R/C Simulator (*www.RealFlight.com*). I learned to fly RC from RealFlight and so have many others. You can too. A free demo is available, and the full version costs under $200 at most hobby stores. It comes with a USB-based transmitter joystick that is modeled after a real RC transmitter. All you need is a Windows computer with a good video card and you'll be flying all sorts of RC planes (and helicopters) right on your desktop.

One warning for you: It's a lot harder than you might think. A lot of pilots expect RC to be trivial for them. Not so! The first time an RC model is coming toward you, it will feel like the controls are reversed. It's hard to keep yourself mentally in the cockpit when you see the plane from the outside. I've worked with some really high-time pilots, a few of them aerobatic experts, and so far I've never seen anyone who wasn't tripped up by this.

However, I do think that after the initial missteps, most IAC members will progress quickly. Most of what you've already learned will translate over to RC in some form. You might even find it to be good training for you, or perhaps it could be another tool to help you become familiar with a new sequence, or even to help you tune your freestyle routine for best presentation.

In fact, I wouldn't be surprised at all to find that some IAC members are already using RC to their advantage.

Jim Bourke is the general manager of Knife Edge Software and a developer of the RealFlight R/C Simulator. He now has 75 hours of aerobatic time, the majority of which were in his Yak-54. He is also the proud owner of a new wardrobe of oil-stained white T-shirts. Jim may be reached at **jtbourke@yahoo.com.**

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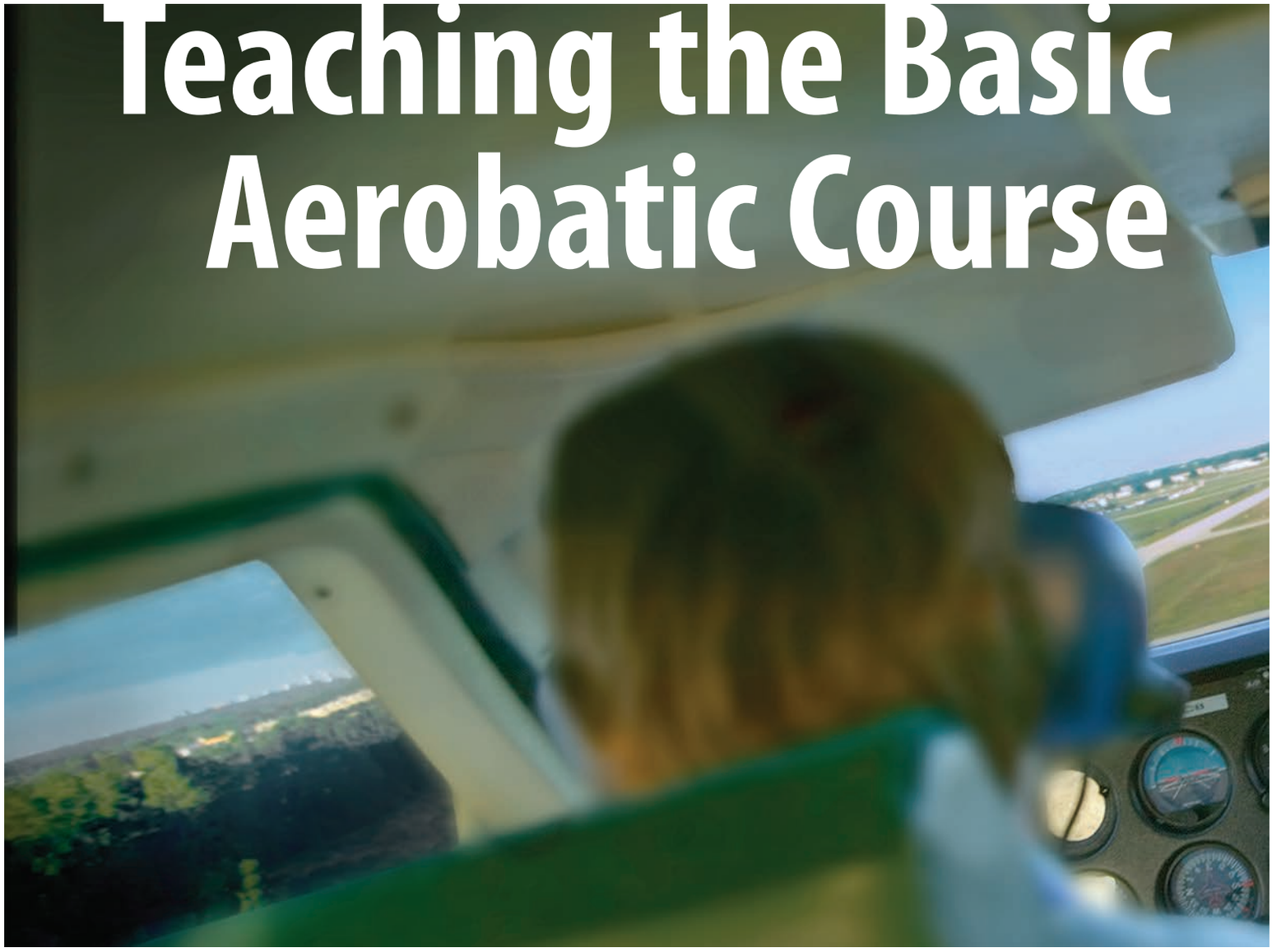

Part One: Laying a good foundation

This is the first of a series of articles about teaching a basic aerobatic course that includes the four fundamental maneuvers of aerobatics (loops, rolls, hammerheads, and spins). The series will focus on the instructor who wants to learn more about teaching the basic course, but will also be helpful to those interested in beginning aerobatics.

Flight instructing is an art, and therefore is personal. I will share my techniques and philosophy, but in the end each instructor will teach with a style of his or her own. Therefore, the information shared here is not meant to be a judgment of the quality of the instruction given by anyone else.

GREG KOONTZ, MCFI-A

I started a lifelong aviation career by becoming a flight instructor at the tender age of 18. Five bucks an hour and all the flying I could ever want. What a deal! I learned to teach from an old veteran named Richard Millar—or Mr. Millar as I always called him. Mr. Millar was truly a lifetime instructor. Starting his own career as a young instructor in the Civilian Pilot Training Program in the '40s, he had more J-3 Cub instructing time than Carter has peanuts.

I found Mr. Millar when I was looking for an instructor to teach me to fly my own restored J-3. Millar did just that, and later, when I sold that Cub, he worked with me on my commercial certificate and multiengine rating. But more importantly, Millar took me on as his student for the flight instructor certificate. It was "old school" at its best, and I locked on to that old man's every word.

Mr. Millar told me, "Young feller, there's telling, instructing, and teaching. You want to be a teacher." Though it didn't come quickly, what he really meant eventually made good sense to me. You can tell people what to do, you can instruct them in the

steps to get it done, or you can teach them in such a way that the instruction becomes ingrained in their thought process.

Millar said that some instructors just "show and tell." They have their students read the book, they take them up in the airplane, they demonstrate how it's done, and then they give the flight controls to the student so he or she can give it a try. If the student can successfully repeat the action, he is considered to have learned it. Little concern is given to the depth of the student's understanding. Many people pass their private pilot checkrides with flying colors by being able to perform each step of the required maneuvers without really having much understanding of what they were doing. It's called "show and tell."

Teaching is bringing a student to a new understanding. It's like drawing a picture in that person's mind. Sometimes it's necessary to break down what's expected into individual steps, but these steps should never be the whole package. The student should see it as the instructor sees it. He needs to have a picture. Mr. Millar used the technique of literally drawing pictures on paper as he explained things. He told me never to save the drawings but instead to let the picture unfold as you present it with your explanation. The trick is learning how to be thorough while trying to keep things reasonably simple.

HABITS BECOME FUNDAMENTALS

The average student coming to Sky Country Lodge for aerobatic instruction is a pilot who generally flies for pleasure or personal/business reasons. Many either fly often, but basically do the same flight over and over, or fly infrequently—say, 30 hours a year tops. Most handle their primary aircraft well and have formed definite habits. In fact, since most people fly the same airplane every flight, they tend to fly by habit. That is, they have procedures for everything.

Teaching basic aerobatics generally starts by interrupting habits and instilling long-forgotten fundamentals. I find that almost everyone who takes the course stumbles a bit when asked questions about basic aerodynamics. These can be questions as simple as, "What makes an airplane turn?" or "What is the rudder for when starting a turn?" Years of set procedures can override the need to think through each action. The first goal of the aerobatic instructor, long before the first roll, is to reconstruct a sound foundation of the fundamentals of flight.

A sound structure requires a strong foundation. Teaching is like building a pyramid. Starting at the bottom, the instructor lays that foundation and then lays the necessary pieces carefully on top, one layer at a time. To skimp on the blocks just weakens the structure. So take the time to build the entire structure. Draw the picture in your student's imagination carefully and thoroughly. I have consistently found that when I attempt to skip something, particularly when I assume the student already knows the information, I begin to leave gaps in learning that invariably return to haunt me later.

The real trick is to keep it simple. Over the years I have learned which fundamentals of aerodynamics to apply to the basic aerobatic course, and I avoid the rest. I use the old instructor's adage, KISS, or Keep It Simple, Stupid! No one is looking for the formula for best L-over-D (lift over drag) here. Aerobatics is an art and things such as "feel" and natural intuition come into play. I have yet to do a loop with a slide rule. We use a sense of judgment to fly, so instructing your student on how a maneuver should look and how it should feel becomes more relevant than the math.

EASY AERODYNAMICS for AEROBATIC PILOTS

My "fundamentals of aerodynamics" starts with a discussion of lift. We are converting a normal pilot to an aerobatic pilot. Most pilots are taught to fly relative to straight and level. They learn to re-create their earthly

two-dimensional existences in the sky. If asked, most students will tell you it requires back-stick pressure to make a turn. This does seem reasonable and would normally be an acceptable statement. But this assumes the desire to maintain level flight. Our goal as aerobatic instructors is to change two-dimensional thinking into three-dimensional thinking. If you get right down to it, *anytime* you bring the direction of lift away from straight up, the lift will cause a curved flight path. Going from level flight into a bank will cause a descending turn if no additional lift is created with back-pressure. Where we point the lift is a big issue in aerobatics.

The wing just doesn't care what attitude it's in. Straight up, sideways, or upside down, it is simply going to do its thing as long as it's being pushed through the air. This really becomes important if we attempt to roll without doing something with the lift! When I was a 16-year-old student, I was sent out of sight of the airport on my first solo to the practice area. As a "bulletproof and invisible" teenager I decided this was my big chance to do a roll. So it was up with the nose and in with the ailerons, with no consideration given to what I was doing with lift. The result was ugly. First, lift made me turn, but as the plane went over on its back, lift and the airplane's weight combined in a frightening pitch toward mother earth! Lesson learned: Lift is the nemesis of roll.

"YOUNG FELLER, THERE'S TELLING, INSTRUCTING, AND TEACHING. YOU WANT TO BE A TEACHER."

This leads us to a discussion of angle of attack (AOA), or, simply put, what changes as we adjust the angle at which the wing strikes the air. Aerobatics is a continuing series of changes to AOA to change lift. Positive AOA is the normal condition where the wing strikes the air with the bottom of the wing, and negative AOA is where the wing is asked to produce lift in reverse with a forward stick position. Right in the middle where the wing strikes at a neutral angle there exists a "zero-lift" AOA. We use positive and negative AOAs to fly right side up and upside down respectively, and we use the zero AOA whenever lift is not desired (like flying vertically or performing the basic aileron roll).

As we explore these different AOAs, we find certain things to be true. First, flight in the positive AOA causes adverse aileron drag when applying ailerons to roll. This requires the application of the corresponding rudder to correct—that is, left rudder for left aileron deflection and right rudder for right aileron deflection. In a negative AOA, the aileron drag is in a mirror image of itself, meaning now you will need right rudder to coordinate a left aileron application and vice versa. At zero-lift AOA, the ailerons create equal quantities of adverse yaw, so no rudder corrections are

required. When you see that Extra 300 doing a perfect vertical roll, the pilot is using lots of aileron deflection but ideally no rudder for aileron drag. When we begin our discussion on specific maneuvers such as rolls, these issues will come up.

LOOK OUTSIDE the PLANE

One more issue to discuss with your student before getting to the maneuvers is orientation. Flying aerobatics depends a lot on the ability to keep up with exactly where we are in relation to mother earth. Staring at blue sky tells us nothing, so we have to be prepared to move beyond the natural tendency to fly our planes while looking straight ahead over the nose. I use a maneuver I call the "crazy-eight" to develop these skills. It is essentially an exaggerated lazy-eight from the commercial pilot requirements. Mine involves using a ground reference such as a long, straight stretch of road instead of a point on the horizon. The idea is to fly the S-turning, climbing, and descending course more like a skateboarder on a giant half-round pipe! Fly big wingovers at the top, then cross the road in level flight. This requires the student to plan a course for the airplane, using the road as the reference. The only way to do this is to turn one's head back and forth from wingtip to wingtip, keeping track of attitude and position. This helps break the student's old habit of staring straight ahead, while introducing them to the world of big attitude changes that is fundamental to aerobatics.

SINCE MOST PEOPLE FLY THE SAME AIRPLANE EVERY FLIGHT, THEY TEND TO FLY BY HABIT.

I hope you are noticing by now that there is a lot of ground school before we ever get to the aircraft. A flight without a good briefing can be a big waste of time. There are just too many things that need to be understood to allow us to skip the ground briefing and jump into the airplane. Just remember to keep it relevant, simple, and no longer than about 45 minutes to an hour, depending on the student and the subject matter.

Purposely left out of this discussion is the first aerobatic maneuver. I teach my basic course in a specific order: aileron rolls, loops, hammerheads, and spins. It is a four-lesson program that introduces a new maneuver with each lesson, while reviewing the previously learned maneuvers. By starting with the aileron roll on the first lesson, there are four more lessons to develop that initially awkward roll into more of a perfected slow roll by the end of the course. Just how much of a slow roll that final product ends up being depends on the student's progress.

The second part of this series will begin a progression through each lesson and will discuss the trials and tribulations of teaching (and learning) basic aerobatic maneuvers. Meanwhile, please direct any questions you may have about teaching or taking aerobatic lessons to *greg@gkairshows.com*. If you want to share your own opinions, please feel welcome. We are all looking to learn.

Greg Koontz has earned the master certificated flight instructor-aerobatic designation and has been teaching basic aerobatic courses since 1974. He is a full-time aerobatic professional who is sponsored by American Champion Aircraft and flies air shows in his Super Decathlon, an aerobatic competency evaluator (ACE), and a member of the International Council of Air Shows ACE Committee. Greg is also a member of the National Association of Flight Instructors and actively supports its efforts to raise the standards for aerobatic instructors.

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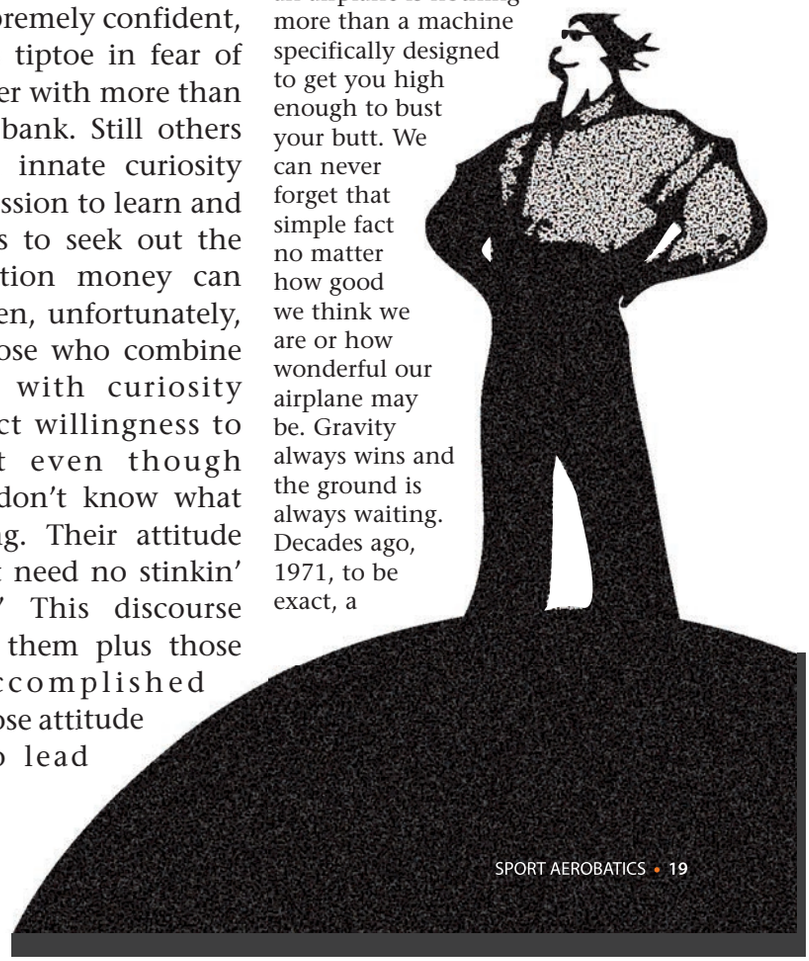
Attitude, Altitude, & Aerobatics

A BAD ATTITUDE IS AS BAD AS NO ALTITUDE

BUDD DAVISSON

It's difficult to draw an accurate profile of those who come into aerobatics. Some are supremely confident, while others tiptoe in fear of any maneuver with more than a 30-degree bank. Still others combine an innate curiosity with an obsession to learn and a willingness to seek out the best instruction money can buy. And then, unfortunately, there are those who combine confidence with curiosity and a perfect willingness to experiment even though they really don't know what they're doing. Their attitude is "We don't need no stinkin' instruction." This discourse is aimed at them plus those already-accomplished aerobats whose attitude is about to lead them astray.

First, let's get a couple of things straight, the most basic of which we've touched on in the past: an airplane is nothing more than a machine specifically designed to get you high enough to bust your butt. We can never forget that simple fact no matter how good we think we are or how wonderful our airplane may be. Gravity always wins and the ground is always waiting. Decades ago, 1971, to be exact, a

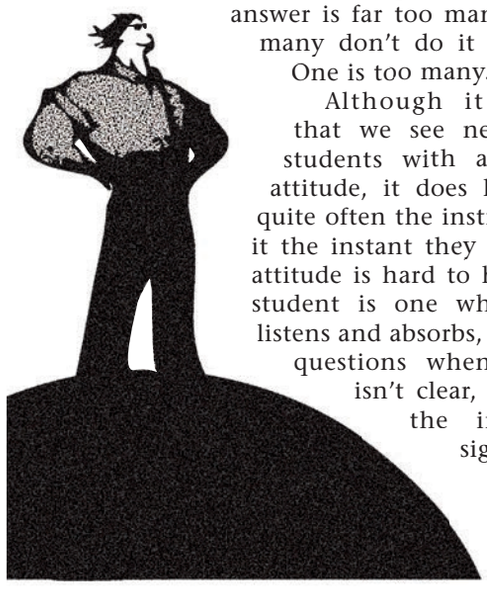


friend and competitor, a member of the world team, was tragically killed during practice. We asked Curtis (is a last name really necessary?) what happened, and in his characteristic slow but concise way, he said, "He lost respect for the ground."

All of that having been said, we need to mention that aerobatics—done correctly—is absolutely as safe as any other form of flying. Why then, do we occasionally hear of pilots, often experienced pilots, getting into trouble with tragic results? Does that mean aerobatics isn't safe and our opening statement about it being no different than any other form of flying, if done correctly, is wrong? No it doesn't, because the operative phrase there is "done correctly." Mechanical failures not withstanding, which are, by the way, extremely rare, aerobatic accidents are most often the result of pilots either not understanding the definition of "done correctly" or redefining the phrase to fit their own concepts. They think they know more than those who originally defined "correctly," and they sometimes pay the price.

What we're talking about here is an attitude problem that can lead to an altitude problem. In most (but not all) cases, enough altitude can make up for the wrong attitude. Unfortunately, one of the first indications of the wrong attitude is when there isn't enough altitude to provide a safety margin for the talent/experience/maneuver ratios: the pilot hasn't developed his talent, has little experience, and is doing a maneuver that is inappropriate for the other factors given the altitude at which it is attempted. The pilot's attitude is that he doesn't need the altitude, when that isn't the case.

A dangerous characteristic of aerobatic airplanes, especially the hot-dog machines like Extras, Pitts, etc., is that they make you feel better than you really are too early. Early in the experience curve, they breed a feeling of invincibility because of their sheer strength and brute performance. They sing a siren song in your ear, drawing you closer to the ground in some sort of test of machismo. How many new Pitts or Extra pilots yield to temptation and do a roll on takeoff or buzz the airport and roll? The answer is far too many. And how many don't do it successfully? One is too many.



Although it is seldom that we see new aerobatic students with a surplus of attitude, it does happen, and quite often the instructor senses it the instant they meet. A bad attitude is hard to hide. A good student is one who not only listens and absorbs, but also asks questions when something isn't clear, which sends the instructor a signal that she needs to make a point more clear. The right attitude for learning is "Let's assume I know nothing, but I want to learn everything." There is, however, a subtle difference between questioning and challenging, and an instructor is keenly aware of the difference and what it signifies. She knows that when a student, who has neither the knowledge nor the experience, immediately begins challenging her methods ("I don't know why you do it this way, I think it would be better if....") that she has a decision to make. First, she can stand up to the challenges and do her best to work past the fence the student is erecting to point out the error of his ways. Unfortunately, an experienced instructor knows in her heart that for some types of attitudes, this almost never works and can lead to some intense competitions. Or, she can admonish him tactfully and let him know that this particular student/instructor mix isn't working and the student would be better off flying with another instructor. In cases like that, a feeling of failure and dread almost always settles over the instructor. She feels failure because she questions whether she could have approached this student in a different way and made it work, and she feels dread because she knows there's the possibility this student's attitude is going to land him in the starring role of an National Transportation Safety Board accident report.

In the area of seeking and accepting help, it's interesting to note that in the field of aerobatics, there seems to be a form of instructional polarization, especially amongst those aerobatic pilots who are well along in gaining experience. There are those who have flown a lot and do aerobatics well, but they still eagerly seek out instructors who can teach them what they need to know to progress. And then there are those with exactly the same amount of flight time and talent who are willing to be judged but seldom, if ever, find their way into a two-place airplane to sample some of the more exotic maneuvers. They'll listen to others talk, read the articles, then go out and try what they just read. The amount of danger they are placing themselves in is directly related to how much training they've had in spin recovery and how much air they put between themselves and the ground. The more the training and higher the altitude, the lower the danger.

With advanced spin training available in so many parts of the country, there is no excuse for not spending a few hours watching the world turned every way but loose and learning how to control it. It only takes a few hours, but those are critical hours and can spell the difference between surviving and the alternative. It's not so much that the training teaches you what to do with your hands and feet as it allows you to clearly see, feel, and understand what the airplane is doing and what you need to do to set things right. Those who have never spectacularly blown a maneuver—even a simple one like pulling past vertical in a hammerhead, then pushing too hard while kicking—have never experienced the momentary confusion that sets in when the airplane does something you've never seen before. That exact instant is what advanced spin training, and training in general, is

all about. Once you've felt the inside/outside difference and have seen the horizon and points of rotation in different positions, you're so much better prepared to deal with the unexpected that it's amazing. However, those who have an it's-just-an-airplane-and-I-can-fly-anything attitude have to realize that maybe they don't have all the answers. They need to convince themselves (since they won't listen to anyone else) that it's a good idea to seek out a spin guru to learn exactly what an airplane expects of them when they've inadvertently backed it into a corner and it departs in some wild fashion.

Incidentally, and this is just a side comment, when teaching and practicing spins, it's more instructive if spins are put in context, meaning, rather than just holding the nose high, stomping and pulling or pushing, you enter the spin where you're likely to see it when doing maneuvers and screwing up, like at the top of a hammerhead, the bottom of an outside, downline corner, etc. And, while setting the spin up, pay special attention to what your butt is feeling and your eyes are seeing just before the airplane departs: feeling and seeing the yaw is a skill that quickly becomes second nature, and you'll intuitively know when you're tiptoeing too close to the edge and the airplane is about to surprise you. Butt recognition training is part of good spin training.

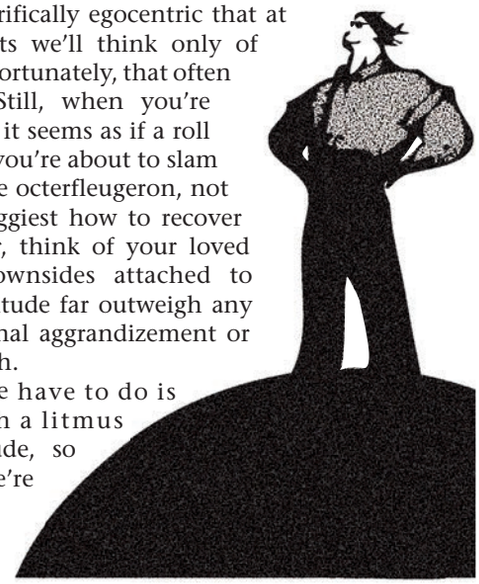
The concept of personal attitude is gossamer and difficult to define, but even so, every person reading this knows when a pilot has the wrong attitude. At the

There is no excuse for not spending a few hours watching the world turned every way but loose and learning how to control it.

What we're talking about here is an attitude problem that can lead to an altitude problem.

same time, the person who has that attitude doesn't recognize what everyone else sees. So, what do we do about it? We can't just walk up to someone and say, "Hey, your attitude is going to get you killed!" Or can we? If it's a friend, we're not doing him any favors by not confronting him. In fact, since the final result of a bad attitude in aviation usually has a worse effect on wives, parents, kids, and friends than it does on the person in question, we owe it to those around the specific pilot to, as tactfully as possible (and that may be impossible), remind him of the risk he is exposing his friends and family to. No one, not even someone with the worst attitude on the planet, really wants to hurt his loved ones. But those with attitude usually don't think that far ahead.

Most of us know when we're about to do something that's pushing our own envelope (read that as doing something stupid). So, when we're just about to step off the precipice into a new adventure for which we're neither trained nor suited, we need to think of those around us. Do we really want to take a chance with their happiness? Is what others see in us as an attitude so terrifically egocentric that at those moments we'll think only of ourselves? Unfortunately, that often is the case. Still, when you're taking off and it seems as if a roll is in order, or you're about to slam into an outside octerfleugeron, not having the foggiest how to recover if it goes sour, think of your loved ones. The downsides attached to the wrong attitude far outweigh any form of personal aggrandizement or adrenaline rush.



Now, all we have to do is come up with a litmus test for attitude, so we know if we're the ones these words were aimed at.

EAA AirVenture Oshkosh 2008
IAC SCHEDULE of EVENTS

Annual Meeting & Member Reception The IAC Annual Meeting and Membership Reception will be held on **Friday, August 1, at 6 p.m. at the Nature Center Tent No. 1.** Election results for the board of directors will be announced. Thanks to our sponsor, Northwest Insurance Group, this is a great event to socialize with fellow IAC members and enjoy plenty of complimentary food and beverages.

AEROBATIC FORUMS AT HONDA FORUMS PLAZA

MONDAY, JULY 28
11:30 am - 12:45 pm
Forums Pavilion 4
Presenter: Budd Davisson
Topic: Choosing the Right Aerobatic Airplane for You

TUESDAY, JULY 29
1:00 pm - 2:15 pm
Forums Pavilion 5
Presenter: Vicki Cruse
Topic: Why Fly Inverted? The Benefits of Aerobatics for GA Pilots.

THURSDAY, JULY 31
10:00 am - 11:15 am
Forums Pavilion 9
Presenter: Gregory Morris
Topic: Competition Aerobatics: Can You Do It?

Aerobatic Workshops at the IAC Aerobatic Center IAC and aerobatic aircraft manufacturers and equipment suppliers have teamed up to present demonstrations and question-and-answer sessions at the **IAC Aerobatic Center Wednesday, July 30, through Saturday, August 2.** Also on hand will be several air show performers who have risen up through the IAC ranks and who will be performing in the daily air show during AirVenture.

	8:30 to 9:45 AM	10:00 to 11:15 AM	11:30 to 12:45 AM	1:00 to 2:15 PM
Wednesday July 30	**Topic:** Special Wiring for the Aerobatic Environment, **Presenter:** B&C Specialty Products	**Topic:** Propeller Safety **Presenter:** Gerd Muehlbauer, MT-Propeller	**Topic:** Aviat/Pitts **Presenter:** Bill Finagin	**Topic:** Autograph Session with **Patty Wagstaff** 1:00 - 1:45 pm
Thursday July 31	**Topic:** Oil Filter Adapters and VAC-2 **Presenter:** B&C Specialty Products	**Topic:** Aerobatics for Fun, Competition, & Air Show **Presenter:** Elgin Wells	**Topic:** Pitts Model 12 by Jim Kimball Enterprises **Presenter:** Kevin Kimball	**Topic:** Aerobatic Engines **Presenter:** Barrett Precision Engines
Friday August 1	**Topic:** Stall/Spin Awareness **Presenter:** Gordon Penner, MCFI-A, Gold Seal Instructor	**Topic:** Emergency Bailout Procedures & Equipment **Presenter:** Allen Silver	**Topic:** Maintenance of Cleveland Wheels & Brakes **Presenter:** TBA	**Topic:** Extra 330 **Presenter:**Kramer Upchurch, Southeast Aero
Saturday August 2	**Topic:** Aerobatics for Fun, Competition, & Air Show **Presenter:** Elgin Wells	**Topic:** Emergency Bailout Procedures & Equipment **Presenter:** Allen Silver	**Topic:** IAC Aircraft Insurance **Presenter:** Ryan Birr, Northwest Insurance Group	**Topic:** Rich Stowell's Emergency Maneuver Training **Presenter:** Gordon Penner, MCFI-A

2008 AEROBATIC FORUMS • IAC PAVILION/TENT

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Merchandise and Member Information The IAC Aerobatic Center is *the* place for club merchandise and information. Come join us and consider us your home during AirVenture.

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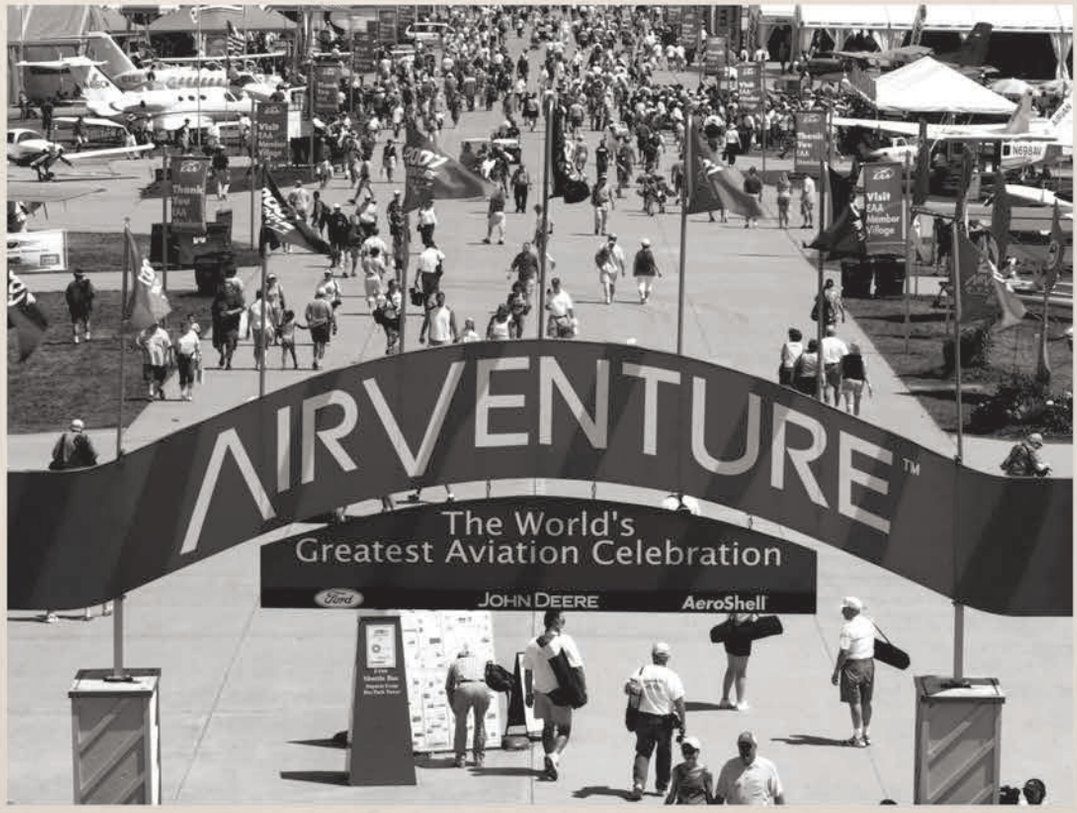

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EAA AirVenture 2008 July 28 - August 3

TECHNICAL ADVISOR

by Ken Appezzato

Redstone Photography

Judgment Day

in the Bible Belt

As I climbed out of Amory, Mississippi, on my way to Greenville, Mississippi, for an air show, with my wife up front and a turtledeck full of luggage, the Pitts-Eagle was up against the aft center of gravity limit. I expected it to feel pitch sensitive, but nothing was out of the ordinary for a cross-country trip in a small biplane. After leveling off at 6,500 feet I pushed forward on the stick, and what happened next got my attention.

I should note that the Pitts-Eagle is an experimental combination Pitts S-2 and Christen Eagle II. The trim system, however, is standard Pitts in that it uses a pitch-trim lever on the left sidewall to mechanically move trim tabs on the elevator; nothing fancy. Today, however, when I pushed forward on the control stick, the stick immediately felt as though I had an electric trim system and someone was running it full nose-up!

After resetting the trim lever to alleviate the pitch-up force, I noticed that the opposite was also true. The slightest pull on the control stick resulted in the trim running full nose-down. Interestingly, though, the trim lever was not moving while the stick forces increased, and each time I was able to trim out the unusual forces.

A quick look back at the tail revealed nothing unusual; nothing fluttering, no loose brace wires, and everything streamlined. So what caused the unusual stick forces? I could only come up with one solution. Maybe I had loaded the plane too far aft, and that had adversely affected the plane's aerodynamic static stability. (I had loaded the plane many times before the same way without any control problems like this, and the weight and balance sheet said I was within limits.) Having checked all the cables that I could see and not finding anything wrong, my solution sounded like a good enough reason for the control issues, so we pressed on toward Greenville, which was only 40 minutes away. Besides, the control forces were manageable, and more importantly, I had an air show to do.

After an uneventful albeit, airliner-type approach and landing, I unpacked the Pitts-Eagle and did a thorough inspection of the trim system and found nothing unusual. All the connections were good, and there was no apparent play in the pushrods and cables. My theory was confirmed, for now. So, after tying down the front seat belts, I was airborne again for the air show practice; however, I wasn't going to perform any high-*g* maneuvers until I could thoroughly flight test the controls.

Setting the trim "nose-heavy" for aerobatics resulted in a plane that felt normal. Just before diving into the box, though, I decided to reset the trim to neutral since that's where I was having "problems." What I found was 3 inches of fore and aft stick movement without any pitch changes. That might be okay in a beat-up old renter airplane, but it's completely unacceptable in an aerobatic thoroughbred. I aborted the practice.

After landing, I once again dug deep into the tail to look over the elevator pushrods, bearings, and bushings. Now I was thinking it's a broken rod-end bearing or stripped rod-end threads. After pulling some inspection panels, I finally found the culprit. The center elevator bracket, which was at one time welded to the frame, had broken free of its mount and was now allowing the center of the elevator to free-float. No air show for me. Now I'd be lucky to get the wings off, tie it down to a flatbed, and drive the plane home by the end of the weekend!

LESSON 1. *If you suspect a problem, land as soon as conditions permit, especially when you're within sight of your home base. Problems never fix themselves, and the headaches that go along with them while at an away base are directly and exponentially proportional!* Why didn't I turn around and land at my home field at the first sight of trouble? It turns out that you can rationalize almost anything when a paycheck and adoring fans are waiting.

The control forces were manageable, and more importantly, I had an air show to do.

Talking with the other performers at the air show, I learned that mine was not the first aircraft to suffer this problem. Several failures of the center elevator bracket on tube and fabric air show aircraft have occurred in the past. Additionally, a history of these failures is not limited to Pitts-type aircraft exclusively.

In my case, the original weld was sorely insufficient. A more detailed inspection of the elevator bracket

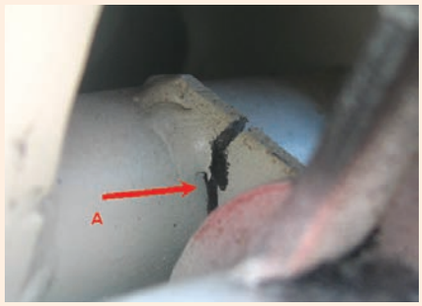

Fig 1. Left-side view. (Left is forward) Elevator bracket still in place with elevator bearing and control horn to the right. Notice where the bracket separated from the frame in relation to where the weld ends. (A)

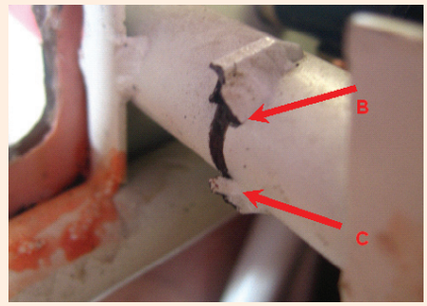

Fig 2. Right-side view. (Right is forward) Elevator and bracket removed. Weld was incomplete on the right side as well. (B) Also notice cold-weld area where bracket broke away from weld material. (C).

revealed that it was only welded on top. The rest was a cold weld with no metal penetration. In other words, the tab was barely held in place to begin with. (See figures 1 and 2.)

Saturday morning was spent pulling apart the tail and opening up the area around the broken tab as much as possible as the fine folks of Greenville Aero Services searched for someone who could weld the bracket back in place. By late afternoon, Alan Nail of Air Repair (Stearman builders) had the bracket welded back in place and reinforced to withstand anything I could serve up.

LESSON 2. *Carefully and continually inspect all welds and control attach points for trouble!* Many tube and fabric aircraft are built for aerobatics, and the Pitts-Eagle is no exception. However, routinely performing Unlimited-type aerobatic maneuvers such as deep tail slides, snap rolls, and other maneuvers that require rapid maximum control deflections put a tremendous amount of stress on the control attach points.

There are not many who would consider a Pitts an Unlimited-class contender. Therefore, those who push the Pitts to its performance limits should have a thorough understanding of its structural condition and weak points.

LESSON 3. *Use your best judgment.* There is reason to believe that my decision to continue troubleshooting, even though I hadn't found any problems after the first inspection, prevented further complications. ***The plane just did not feel right.*** Listening to your personal master warning light and using good judgment is critical to staying safe and becoming an old aerobatic pilot instead of being a fondly remembered bold aerobatic pilot.

Ken Appezzato is an air show performer in the southeast as well as an instructor pilot for the U.S. Air Force. You can e-mail him at **ken@vortexaerobatics.com.**

Redstone Photography

Phil Weston • *www.westonimaging.com*

SPORT AEROBATICS SNAPSHOT

The Collaborators over Lake Butte des Morts before performing at EAA AirVenture Oshkosh in 2007.

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Robert Armstrong (Northwest Region)	706.549.7583	–	*rba@coraid.com*
Erica Simpson (Southwest Region)	386.235.5744	–	*redpittsdriver@aol.com*
Debby Rihn-Harvey (South Central Region)	281.470.8456	281.470.8456	*hurricane@sbcglobal.net*
Greg Dungan (Northeast Region)	301.994.0083	301.342.5003	*greg.dungan@verizon.net*
Tom Adams (Southeast Region)	615.384.1018	615.382.9090	*pitts58ct@cs.com*
Darren Pleasance (IAC Board Appointed Director)	650.212.1806	650.842.8282	*darren.pleasance.1995@anderson.ucla.edu*
Louie Andrew (EAA Representative)	920.921.6000	920.921.0226	*landrew@titleservice.com*
UNLIMITED AEROBATICS USA			
Norm DeWitt	650.321.8499	–	*norm.dewitt@gmail.com*

Courtesy MSW Aviation

CALENDAR

10TH ANNUAL OKIE DUST DEVIL (South Central)
Friday, July 11 - Saturday, July 12, 2008
Practice/Registration: Thursday, July 10 - Friday, July 11
Rain/Weather: Sunday, July 13
Power: Primary through Unlimited
Location: Thomas P. Stafford Airport (OJA): Weatherford, OK
Contest Director: John Creswell
Phone: 580-774-9176; E-mail: *creswell@classicnet.net*
Website: ***www.G-Loc.com/iac_59/index.htm***

GREEN MOUNTAIN AEROBATIC CONTEST (Northeast)
Friday, July 11 - Sunday, July 13, 2008
Practice/Registration: Thursday, July 10 - Friday, July 11
Power: Primary, Sportsman, Intermediate, Advanced
Location: Hartness State Airport (VSF): Springfield, VT
Contest Directors: Wes Liu and Bill Gordon
Phone: 603-673-6538; E-mail: *weston.liu@charter.net*
Website: ***http://IAC35.AerobaticsWeb.org***

CANAM AEROBATIC CHAMPIONSHIP (Mid-America)
Saturday, July 12 - Sunday, July 13, 2008
Practice/Registration: Thursday, July 10 - Friday, July 11
Power: Primary through Unlimited
Location: Jackson Co. Airport - Reynolds Field (JXN): Jackson, MI
Contest Director: Robb Butts
Phone: 734-255-2263; E-mail: *rtbutts@live.com*

ASPEN LEAF ACRO CHALLENGE (South Central)
Saturday, August 16 - Sunday, August 17, 2008
Practice/Registration: Friday, August 15
Power: Primary through Unlimited
Location: Sterling Municipal Airport (STK): Sterling, CO
Contest Director: DJ Molny
Phone: 303-619-4814; E-mail: *djmolny@yahoo.com*
Website: ***www.IAC12.org***

KATHY JAFFE CHALLENGE (Northeast)
Friday, August 22 - Sunday, August 24, 2008
Practice/Registration: Thursday, August 21 - Friday, August 22
Power: Primary through Unlimited
Location: Flying W Airport (N14): Lumberton, NJ
Contest Director: Ron Chadwick
Phone: 732-865-1610; E-Mail: *bubbaron@comcast.net*
Website: ***www.IAC52.org***

SALEM REGIONAL AEROBATIC CONTEST (Mid-America)
Saturday, July 26 - Sunday, July 27, 2008
Practice/Registration: Friday, July 25
Power: Primary through Unlimited
Location: Salem-Leckrone Airport (SLO): Salem, IL
Contest Director: Bruce Ballew
Phone: 314-369-3723;
E-mail: *bruceballew@earthlink.net*

DOUG YOST CHALLENGE (Mid-America)
Saturday, August 23 - Sunday, August 24, 2008
Practice/Registration: Friday, August 22
Power: Primary through Unlimited
Location: Albert Lea Municipal Airport (AEL): Albert Lea, MN
Contest Director: Mike Niccum
Phone: 952-239-7114; E-mail: *pgnic@aol.com*
Website: ***www.IAC78.org***

HAPPINESS IS DELANO (Southwest)
Saturday, August 30 - Sunday, August 31, 2008
Practice/Registration: Friday, August 29
Power: Primary through Unlimited
Location: Delano Municipal Airport (DLO): Delano, CA
Contest Director: Tim Just
Phone: 760-953-8250;
E-mail: *upsidwn2000@yahoo.com*

GULF COAST REGIONAL AEROBATIC CHAMPIONSHIP (South Central)
Saturday, August 30 - Sunday, August 31, 2008
Practice/Registration: Friday, August 29
Power: Primary through Unlimited
Location: Brenham Municipal (11R): Brenham, TX
Contest Director: Bryan Butler
Phone: 979 251-2274; E-Mail: *bryanbutler@nctv.com*

HAROLD NEUMANN BARNSTORMER (South Central)
Friday, September 5 - Saturday, September 6, 2008
Practice/Registration: Thursday, September 4
Rain/Weather: Sunday, September 7
Power: Primary through Unlimited
Location: New Century AirCenter Airport (IXD): Olathe, KS
Contest Director: Paul Thomson
Phone: 913-638-6221;
E-Mail: *info@iac15.org*
Website: ***www.IAC15.org***

EAST COAST AEROBATIC CONTEST (Northeast)
Friday, September 5 - Sunday, September 7, 2008
Practice/Registration: Friday, September 5
Power: Primary through Unlimited
Location: Warrenton-Fauquier Airport (HWY): Warrenton, VA
Contest Director: Scott Francis
Phone: 703-618-4132; E-Mail: *s.francis@ieee.org*

ILLINOIS STATE AEROBATIC CHAMPIONSHIP (Mid-America)
Saturday, September 6 - Sunday, September 7, 2008
Practice/Registration: Friday, September 5
Power: Primary through Unlimited
Location: Illinois Valley Regional Airport (VYS): Peru, IL
Contest Director: Doug Bartlett
Phone: 847-875-3339; E-Mail: *dbartlett@bartlettmfg.com*
Website: ***www.IACChapter1.com***

U.S. NATIONAL AEROBATIC CHAMPIONSHIPS (US Nationals)
Sunday, September 21 - Friday, September 26, 2008
Practice/Registration: Saturday, Sept. 20 - Sunday, Sept. 21
Rain/Weather: Saturday, September 27
Glider: Sportsman through Unlimited
Power: Primary through Unlimited
Location: Grayson County Airport (GYI): Sherman, TX
Contest Directors: Doug Bartlett and Erica Hoagland
E-Mail: *iac@eaa.org*

ROCKY MOUNTAIN INVITATIONAL (South Central)
Saturday, October 4 - Sunday, October 5, 2008
Practice/Registration: Friday, October 3
Gliders: Sportsman and Intermediate
Power: Primary through Unlimited
Location: Lamar Municipal Airport (LAA): Lamar, CO
Contest Director: Jamie S. Treat
Phone: 303-648-0130; E-Mail: *JamieTreat@q.com*
Website: ***www.IAC5.org***

REBEL REGIONAL AEROBATIC CONTEST (Southeast)
Saturday, October 11 - Sunday, October 12, 2008
Practice/Registration: Friday, October 10
Rain/Weather: Monday, October 13
Power: Primary through Unlimited
Location: Everett-Stewart Regional Airport (UCY): Union City, TN
Contest Director: Mike Rinker
Phone: 731-885-3701 or 731-796-0849

2008 MASON-DIXON CLASH (Northeast)
Friday, October 17 - Sunday, October 19, 2008
Practice/Registration: Thursday, October 16 - Friday, October 17
Power: Primary through Unlimited
Location: Farmville Regional Airport (FVX): Farmville, VA
Contest Director: Chris Rudd
Phone: 850-766-3756;
E-Mail: *akrudd@gmail.com*
Website: ***www.IAC19.org***

BORREGO AKROFEST (Southwest)
Friday, October 17 - Saturday, October 18, 2008
Practice/Registration: Thursday, October 16
Rain/Weather: Sunday, October 19
Power: Primary through Unlimited
Location: Borrego Springs (L08): Borrego Springs, CA
Contest Director: Joshua Muncie
Phone: 562-688-1466; E-Mail: *jlmuncie@yahoo.com*
Website: ***www.iac36.org***

For the most complete and up-to-date contest listings, visit *www.IAC.org.* If your chapter is hosting an event, be sure to let the world know by posting it there.

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