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Sport Aerobatics

OCTOBER 2006

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Aerobatics

VOLUME 35 - NUMBER 10 OCTOBER 2006

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DEPARTMENTS

Photo courtesy Rob Holland

M.E. Szper flyingfrog.com

Lee Fray

Weston Liu

On the Cover:

U.S. Advanced Aerobatic Team pilot Jeff Boerboon flies an Extra 300 over Radom, Poland at the Advanced World Aerobatic Championships. Photo by: Freddy Stenbom

Letter from the Editor

By Scott Westover

Each month, *Sport Aerobatics* provides IAC members with a glimpse of aerobatic activity from several perspectives. We understand that some members are competitors and others are recreational enthusiasts. What all of us have in common is that we are proud of our "unusual attitudes."

Flying aerobatics and writing about them are two different things, but for many of our members, sharing their adventures is part of the fun. As the editor of *Sport Aerobatics*, I have the opportunity to read all kinds of stories from our members—and believe me, everything gets read! Sometimes those stories end up in print, and other times I burn them to destroy evidence and protect the author. Seriously, reading about what aerobatics means to our IAC community and being aware of the action taking place in different IAC chapters constantly tops off my tank and increases my passion for our sport.

For example, in this issue Don Peterson shares his experience at the Advanced World Aerobatic Championship (AWAC) held in Poland this past August. For many of our members, including me, reading about AWAC may be as close as they ever get to competing at the world-class level. However, when I read about Don's experience, I realize that it *could* happen…if that's what I really want to do. There is enough support from other aerobatic pilots to help all of us reach our flying goals. For some pilots that goal is to fly a perfect figure in front of an international judge. For others the goal is to fly a round loop in their local practice box for the personal satisfaction of flying to the best of their ability. Even though we may spend a lot of time flying solo, we're not really alone in our aerobatic pursuits. And that support comes from different places. This past summer while at Oshkosh I listened to several IAC members talk about their passion and projects, and how they would not be flying if not for the support of their family (it takes a lot of love to allow a set of wings to begin life on the kitchen table—just ask Dave Lucas, the patient builder you met last month through this magazine).

Please keep your stories coming and let us know where aerobatics takes you. What have you accomplished, and what are your goals? Contributing to *Sport Aerobatics* is a chance to inspire fellow aerobatic pilots and to offer a public "pat on the back" to some of those folks who helped you sprout wings. I look forward to hearing from you.

Scott Westover can be reached by e-mail at tookyflyer@tds.net.

Sport Aerobatics is YOUR magazine. To submit news, comments, articles, or article ideas, please send them to: IAC, P.O. Box 3086, Oshkosh, WI 54903-3086; or email them to editorial@iac.org.

Sport Aerobatics

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President's Page

by VICKI CRUSE IAC 22968
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Conquering Adversity

The U.S. Advanced Aerobatic Team proves patience pays

This month's *Sport Aerobatics* feature story is about the 2006 U.S. Advanced Aerobatic Team, but it's about more than competition. It's about individuals pursuing excellence, charting new ground, and making all U.S. aerobatic pilots proud.

Last year at this time, the Advanced Team was selected. Twenty-four hopefuls tried for eight pilot and two alternate slots. Every team aspirant had hopes the Advanced World Aerobatic Championship would be held in Jean, Nevada, just outside Las Vegas. Those hopes were dashed when Radom, Poland, put in a last-minute bid and won the selection. Many thought several U.S. team members would drop out due to the hardship they would have to face to find an airplane, raise necessary funds, and travel to Poland. As it turns out, "many" underestimated the members of the team.

Every pilot decided the goal was worth pursuing. For some this may be a true once-in-a-lifetime opportunity. First alternate Steve Johnson made plans to make the trip as well. The Advanced Team is perceived to be a unique opportunity because everyone goes into it believing it is the "least expensive" team alternative, though nothing in this sport should be considered "inexpensive." Advanced is more of an individual effort than Unlimited because everyone is on his or her own to raise funds, find an airplane, and prepare under the oversight of the team manager, the unflappable Julia Wood. Team members don't train together because rental planes come from all over Europe at different times…and some don't arrive at all.

The challenges faced by the team members are unique. This year's team found a way to come together by sharing airplanes, as did Jeff and Hector, Robbie and Walt, and Don and Mike. Rob, Todd, and Steve were on their own. Renting an airplane in the United States can be challenging, but finding one in Europe took serious effort despite the "sharing" philosophy imparted by the AWAC essence. Rental rates are staggering, with our guys paying $400 to $600 per hour for the use of an aircraft. Then there was the airplane that never arrived. While Todd's Edge 540T never made it to Poland, thanks to the graciousness of Alan Cassidy from the United Kingdom and Extra Aircraft in Germany, along with Jeff and Hector, Todd had airplanes to fly.

The biggest challenge our team faced was completely out of its control and the same challenge faced at local contests: weather. Suffering through a weather pattern that parked itself over Eastern Europe, the team had hours upon hours on its hands to simply sit and wait. Imagine coming to a contest day after day, waiting for good weather, and finding only a few hours at a time when someone finally gets the chance to take to the skies. Some pilots hoping their turn will come before the weather deteriorates, and others wishing for it to hurry up and go south.

Last was the fundraising effort: some people did a little, and some did a lot. They also got help from fellow IAC members, making their efforts a little easier. Aerobatics is a hobby and an expensive one at that, especially for those seeking competition on the world level. It's often considered a rich man's sport, and in some ways it is. But it's also a sport that allows one to challenge oneself to seek perfection through mastery of a machine. There are rewards in this hobby that those who never try it, will never understand. There are also personal rewards, like the ordinary guy finding himself competing at a world competition; something he never imagined when the dream of flight took hold. This is a solitary sport until individuals come together to fly as a team and help each do his or her best. The U.S. Advanced Aerobatic Team overcame adversity, and everyone came out a winner. Although not everyone brought home medals, all shared an experience few of us will ever know and one that they will never forget. Congratulations to you all on behalf of the IAC. We couldn't be more proud to have you represent the United States and all of us who hung on every moment wishing you the best.

Freddy Stenbom

Steve Johnson pilots a Pitts S2B at AWAC.

Patrick Dugan Earns Master Instructor–Aerobatics Designation

The National Association of Flight Instructors (NAFI) and the International Aerobatic Club (IAC) take pride in announcing a significant aviation accomplishment on the part of Patrick Dugan, an aerobatic flight instructor and a resident of Ventura, California. Recently, Patrick was designated a Master Instructor–Aerobatics by NAFI and the IAC.

Patrick Dugan designated Master Instructor–Aerobatics by NAFI and the IAC.

To help put this achievement in its proper perspective, there are approximately 90,000 certificated flight instructors (CFIs) in the United States. Fewer than 500 of them have achieved that distinction thus far. The last 11 national Flight Instructors of the Year were Master Instructors, and Patrick is one of only 40 California aviation educators who has earned this prestigious Master title and one of only 10 to earn the aerobatics accreditation.

The Master Instructor designation is a national accreditation recognized by the FAA that is earned by candidates through a rigorous process of continuing professional activity and peer review. Much like a flight instructor's certificate, it must be renewed biennially. This process parallels the continuing education regimen used by other professionals to enhance their knowledge base while increasing their professionalism. Simply put, the Master Instructor designation is a means by which to identify those outstanding aviation educators, those "teachers of flight" who have demonstrated an ongoing commitment to excellence, professional growth, and service to the aviation community. In the words of FAA Administrator Marion Blakey, "This accreditation singles out the best that the right seat has to offer."

EAA Seeks to Preserve Homebuilders' Rights

Association co-leads amateur-built aviation rulemaking committee

With mounting concern that some builders-for-hire and commercial providers are performing too much of the aircraft-building tasks when assisting clients, the Federal Aviation Administration (FAA) on September 6 assembled the first meeting of the Amateur-Built Aircraft Aviation Rulemaking Committee. EAA holds a key leadership position on this committee with one interest in mind: preserving the rights of amateur builders.

"With this much FAA scrutiny, our members' rights to build and fly their own aircraft are at risk. Those individuals and vendors who circumvent the letter and intent of the experimental rules are putting all amateur-building enthusiasts' privileges in jeopardy," said Earl Lawrence, EAA vice president of industry and regulatory affairs, whom the FAA appointed as co-chair of the committee. Lawrence shares the committee's leadership with FAA Manager Frank Paskiewicz and Van's Aircraft CEO Richard VanGrunsven.

The meeting included 17 representatives of government, general-aviation groups, and aircraft kit manufacturers. "Our participation and leadership on this committee provides an effective avenue for protecting the rights of our EAA-member builders, craftsmen, kit-assemblers, and restorers," Lawrence said.

In last week's meeting, the group refined its mission, distilling its broad purpose of examining the letter and intent of the experimental aircraft rules—the federal regulations on the amateur building of aircraft—into several objectives:

- Investigate the effects of builder or commercial assistance on compliance with the "51 percent rule," the stipulation that an individual must perform the majority of the construction tasks in building an experimental airplane;
- More precisely define the elements of the 51 percent rule to ensure more uniform application and adherence across the industry;
- Explore opportunities for creating new amateur-building regulations, directives, advisory materials, and implementation strategies that would advance the represented groups' mutual interests; and
- Document findings and present them to the appropriate policymaking authorities.

The group broadly agreed on its interest to preserve the original language and intent of the amateur-building regulations. There was also consensus that builder or commercial assistance should remain an option

for those attempting to build their own airplanes.

The group's focus, then, will lie on the trend of builder or commercial assistance circumventing the intent of the regulations and thereby performing the majority of the construction tasks on behalf of the customer.

"In the meantime," Lawrence said, "we are counting on the amateur-building community to practice good peer-review and self-policing techniques. Cutting corners on the 51 percent rule is a disservice to the educational and recreational function for which the aircraft-building experience is intended. When amateur builders ensure that they perform the majority of the tasks, they are protecting not only their individual rights, but also the liberties enjoyed by the entire experimental aircraft movement." The committee will take its next steps during a meeting scheduled to take place in November in Washington, D.C.

The following item appeared on the Aero-News Network (www.Aero-News.net).

Pilot Recovers Plane After Engine Loss, Bailout

And we do mean 'engine loss…'

What started as an afternoon jaunt over the beach turned into an ordeal—but one heck of a story to tell—for pilot Floyd Brown.

Brown, a 17-year pilot for Delta Air Lines, was as surprised as those watching him on Topsail Beach, North Carolina, were when his Christen Eagle II experimental biplane lost its engine at 2,000 feet above ground level, while maneuvering overhead on September 3.

And by "lost its engine," we mean exactly that. The block sheared off the airframe. Fortunately, Brown kept a level head as the plane tumbled and fell—managing to bail out and hitting the silk at 700 feet over the water.

"The plane suffered a catastrophic failure when the engine came off," Brown explained. "I have crashed two previous planes, but they were manageable, and I rode them to the ground." Brown landed safely in the water and was picked up a short time later by a vacationing family in a boat.

"I had 15 seconds to figure out what to do," the pilot added. "We practice egress all the time, but I had to do it in a flash."

Once safe on the ground, Brown's attention turned to recovering his beloved plane, which had also fallen into the ocean. As it turns out… bailing out of a damaged airplane wasn't the most difficult ordeal Brown had to face. As the accident involved a homebuilt aircraft and did not result in serious injury or an insurance claim, the FAA said it wouldn't help pull the plane from the ocean. Ditto for those with the Pender County division of the Wildlife Resources Commission.

In the end, Onslow County Sheriff Ed Brown, after checking with his counterpart in Pender County, allowed divers from his department to help Brown. Alas, the engine was nowhere to be found, but Brown said he'll keep looking. He also asked those who may find engine parts washed up on the shore to contact the Topsail Beach Police.

Courtesy of Rob Holland

Rob flies a one-of-a-kind Ultimate 20-300S biplane at air shows from coast to coast.

Flying the Slow Roll

"Slow" really has nothing to do with it!

The name "slow roll" confuses some students. When you think about it, it's a rather odd name considering that "slow" really has nothing to do with flying the maneuver. Maybe a better name would be the "complicated roll" or the "master of coordination roll." They might not look as good on a bumper sticker, but they would more accurately describe this maneuver.

By Rob Holland

This month we will dissect this basic yet complex maneuver by sharing the mechanics of flying it and highlighting the challenges that I frequently help students work through. At its core, the slow roll is considered basic because it is the foundation of so many maneuvers in the *Aresti Aerobatic Catalogue*. Knowing that they will build on this foundation inspires most students to work through the difficulty and master the maneuver. It is a complex maneuver because to fly it with precision requires coordination—and practice—to truly get it right.

Let's start at the beginning. What is a slow roll? It is simply the act of rolling an aircraft 360 degrees around its longitudinal axis without changing heading or gaining or losing altitude. That sounds simple enough, right? Grab your parachute and let's head to the practice area to see how

gravity, lift, drag, and thrust tend to complicate things.

To perform a slow roll, we first need to understand the dynamics of what is happening with the aircraft as we roll the airplane. Let's study this a bit by looking at what happens to the aircraft if we simply push the stick to the side. For this article we will go left and roll the airplane 360 degrees without worrying about any other control inputs.

From level flight we push the stick full left. The first thing we will notice is that the airplane starts to roll to the left, but at the same time the nose begins to yaw to the right. This is caused by adverse yaw. The downward deflecting aileron on the right wing is producing a higher angle of attack (AOA) than the upward deflecting aileron on the left wing. While this lopsided lift favoring the right wing helps roll the aircraft, it also creates more induced drag. That drag holds back the right wing, which causes the yaw to the right.

As the plane rolls, the main vector of lift remains perpendicular to the chord of the wing, which means we will be losing our vertical component of lift and adding to the horizontal component of lift. As we lose the vertical component of lift required to maintain level flight, the nose will start to drop and the rest of the airplane has to follow…we start to descend. Remember, at this point we are flying the roll using only full left stick. As we pass through knife-edge flight (90 degrees of bank) and start to roll inverted, we are still carrying a "positive" AOA. However, our lift vector is now directed at the earth below, causing us to lose more altitude and drive the nose further toward the ground. At the same time gravity is helping things along, and we are dramatically increasing airspeed.

I'm sure you can see where this is going. By the time the roll is completed, the aircraft will be dramatically nose-down, increasing airspeed and losing altitude. Some of you may have recognized this maneuver as the good old aileron roll. And you would be right if we had pitched the nose up about 30 degrees above the horizon before we started the actual roll. You can see through this example why that initial change in attitude at the beginning of an aileron roll is so important.

So, how do we roll the plane without this happening? The answer is to use all of the control surfaces at the right time as we roll around the longitudinal axis. Let's start from the beginning.

By the time the roll is completed, the aircraft will be dramatically nose-down, increasing airspeed and losing altitude.

Again, we are at a safe altitude and getting ready to roll left. This time we pick a good reference point in front of the airplane. That point helps us recognize how we need to fine-tune the control inputs to prevent the "corkscrew" we experienced when using only the ailerons a few moments ago. When pushing the stick to the left, it is important to mention that the aileron deflection is really the only "constant" during this maneuver. As we start the roll, we need to counter the adverse yaw described earlier. We do this with the application of left rudder as we apply the left stick to coordinate the beginning of the roll.

As the airplane approaches close to 45 degrees of bank, the loss of vertical lift is going to cause the aircraft to start to descend. We can counter this by now applying some right rudder. Interestingly, we don't need too much right rudder. Adverse yaw is trying to yaw the plane right, and that is what we are trying to achieve with right rudder. In fact, too much right rudder will cause the nose to yaw too far to the right.

As we start to approach knife-edge a few things need to happen, and the pilot's ability to coordinate the control surfaces over the next few moments will make or break the rest of the roll. We need to lower the AOA of the wing. If we forget to lower the angle of attack, then the aircraft will begin to turn. Reducing AOA is accomplished with slight forward pressure on the stick. While passing through knife-edge we need to compensate somehow for the complete lack of vertical component of lift required to maintain altitude. We can accomplish this by adding a bit more right rudder to get the nose of the aircraft above the horizon.

Sometimes pilots new to aerobatics have difficulty understanding that sometimes traditional control inputs have a different effect in aerobatic flight than they do in traditional flight attitudes. For example, while the aircraft is knife-edge, the rudder is in essence acting as an elevator. The fuselage of the aircraft on its side is an inefficient wing and will create some

Courtesy of Rob Holland

Rob Holland is the owner of Aerial Advantage Aviation, located in Nashua, New Hampshire. The mission of the flight school is to make safer, more highly skilled pilots through superior education and training.

lift if it is at an AOA to the relative wind. Though it's not a good way to generate lift for a cross-country flight, it is enough to help us maintain altitude for the short time we are knife-edge in the roll.

As the roll continues toward inverted, we now need to push to maintain our relationship to the reference point. For lack of a better term, we need to create a negative AOA. We need the bottom of the wing to create a vertical component of lift to maintain altitude.

As we approach completely inverted, we will be at our maximum forward push on the stick. You should also be at -1*g* as you pass through level inverted flight (remember that upright level flight is 1*g*, so level inverted flight is -1*g*). This is actually a great way to determine if you have the right amount of forward stick during the roll. If, when the roll is completed, the *g*-meter reads more than -1*g*, you pushed too hard. If it reads less than -1*g*, you didn't push enough. Checking the *g*-meter really helps you understand the forces required to fly maneuvers well.

Now that the airplane is passing inverted, you will also need to maintain right rudder. The ailerons are still deflected for a left roll (left stick), and the wing is at a "negative" AOA. Therefore you need to keep pushing on the right rudder pedal to coordinate the roll and counter adverse yaw inverted. This is because relative to the new negative AOA the rudder is now hinged backward while you are inverted. Therefore right rudder is required to counter the left roll. If you happen to have a model airplane handy, turn it upside down and move the rudder as if the pilot has applied full right rudder.

Checking the g-meter really helps you understand the forces required to fly maneuvers well.

You will see that the effect on the airplane is as if the pilot has applied full *left* rudder.

As the roll now continues to the 225- to 230-degree point of the roll, you will start backing off the forward pressure a bit and transition to left rudder again. Left rudder is needed as the plane approaches the 270-degree point of the roll (right knife-edge) to again increase the AOA of the fuselage to create enough lift to maintain altitude. As the roll continues back to upright from right knife-edge, make sure you no longer have any forward pressure on the stick so as to not cause the nose of the aircraft to be pushed down as you re-establish straight and level flight. You will also need to increase the amount of left rudder to counter the adverse yaw from the left roll coming back upright.

As the plane approaches level, return all the controls back to the position that was required to maintain level flight. It still sounds simple enough, right? Here are some tips to help you with your rolls.

Whether you are in a fast-rolling monoplane or a slow-rolling Decathlon, push the stick in to the direction of the roll smoothly. Don't "jam it over" as fast as you can. You don't want to deflect the ailerons so fast that the air separates from

them momentarily. When the roll ends, you can pull the ailerons back to neutral as fast as you want. Just remember, "Smooth in, fast out."

The roll will always require less rudder at the first knife-edge and more rudder at the second knife-edge. This is because adverse yaw is working with you to keep the nose above the horizon at the first knife-edge. Adverse yaw is working against you at the second knife-edge trying to bring the nose down below the horizon, so more rudder is required to overcome it.

When practicing your slow rolls, reset you *g*-meter before each roll. When the roll is completed it should read no more than 1 positive *g* and no more than 1 negative *g*. This will help you to determine if you are using the appropriate amount of elevator in the roll.

Keep a constant amount of aileron in the roll. If you're going to use full aileron, keep full aileron till the roll is done. If you are going to use only half aileron, then use only half all the way around.

Happy rolling, and remember that there is no substitute for practice. Be sure to practice within your own limits, and take your time. Come to think of it, maybe the maneuver is called the slow roll because it takes so long to fly well!

If you have any questions or comments, please e-mail me at *AerialAdvantage@earthlink.net*.

Courtesy of Rob Holland

Rob Holland placed second overall at the 2006 World Aerobatic Championships.

The Advanced World Aerobatic Championships

The team perspective from over the shoulder and looking back

M.E. Szper flyingfrog.com

AWAC is not an unchanging game of absolutes. Anyone who claims they have all the answers to winning this event has either never been there, was not paying attention when they were, or isn't much of a student of history. This was my fourth AWAC as a competitor, and fifth if you count the similar AEAC in 2003 (the Advanced European Aerobatic Championships are pretty much the same as AWAC, just missing a few countries from across various oceans). Each time the contest has been different than before, with the judging styles evolving, the quality of the pilots increasingly strong, and the capability of the aircraft moving upward. Every event has delivered new impressions, hard lessons learned, a few tidbits of insight, and a growing sense of bewilderment. The sport evolves, and this contest changes in concert.

By Don Peterson

Nine of us from the United States just flew in the seventh Advanced World Aerobatic Championships in Radom, Poland, with our top three pilots, Rob Holland, Jeff Boerboon, and Hector Ramirez, earning the team Silver, and the individual Silver for Rob Holland. This is the best overall result since the United States took the Gold team and Silver and Bronze individual awards at the '97 event in Lawrence, Kansas, and is the best result yet for an overseas team.

We asked each of the pilots and the team manager to pen a few words describing their experiences. The following should give you an idea of what to expect, and perhaps how to prepare for a winning result at AWAC. It certainly isn't Kansas anymore, Toto.

"At the contest every team member and family member looked out for each other, stood up for each other, helped each other and supported each other. This wasn't just a group of pilots attending a contest in Poland. This was truly a world-class, top-notch, professional, and cohesive team!"

Julia Wood, Team Manager

"We were a team in the truest sense of the word. We helped each other, were there for each other, and encouraged each other. Everywhere we went, we were together...as a team, in uniform. And as much as it helped each of us, I think it made an impression on everyone else there. Also, we had the leadership of Julia, who, from day one after Nationals, started structuring us all as a team. I don't think we could have done it with-

US Advanced Aerobatic Team manager Julia Wood accepts the second place trophy with top placing pilots Hector Ramirez, Rob Holland, and Jeff Boerboon as the first place Russians and third place French look on.

Judy Abraham

Mike Gallaway shares his excitement over better weather.

out her, and I don't think anyone could have filled her shoes (and not because her feet are so small)!"

Rob Holland

What Is AWAC?

AWAC came into being with the first event held in 1995 in South Africa. More than 50 pilots attended, and it has been a runaway success ever since. The basic concept is that by limiting the difficulty of the individual maneuvers, a world championship contest will be accessible to a wider array of pilots, aircraft, and budgets. In the early years there was some debate as to whether the event was a true world championship or simply a training ground for future World Aerobatic Championship (WAC) teams. As Unlimited has become an increasingly unrealistic hope for most pilots, and many countries once among the champions' list have abandoned WAC competition entirely, AWAC has come to be viewed as a highly coveted, well-attended, world-class event. Somewhat different than the WAC, countries other than Russia, France, and the USA have a reasonable expectation of success. Medal winners have included the Czech Republic, England, Ukraine, Poland, and South Africa, among others, as well as the traditional three of Russia, France, and the USA.

This year's event had 20 countries and 64 pilots, putting it among the largest international aerobatic contests ever held. It is possible that this success will force the contest to evolve further, simply to ensure that the pilots are able to fly in the available time and weather.

"A key ingredient to a successful contest is having overseas support. Without that there would be no AWAC. Marek Szufa, the contest director, organized a world-class event and gave every pilot, all 64 of us, extraordinary attention and guidance. Laurie and I really appreciate the special attention and warm friendship he showed us during our visit.

Ultimately all the planning and training is of little value unless there is an aircraft to fly. For this I am indebted to Kramer Upchurch and Bruno Van Waeyenberghe of the Extra Aircraft family for making Bruno's personal aircraft available for our use at AWAC. Three team members, Jeff Boerboon, Todd Whitmer, and I, could not have participated without their help, and we are very appreciative."

Hector Ramirez

How Is the Team Selected?

Every country has its own method of selecting their team pilots, and in the United States we pick from the top-placing applicants at our US National Championships held in September the year before the AWAC. Typically, we have selected eight pilots, which is the maximum the Commission Internationale de Voltige Aerienne (CIVA) rules allow on a national team. The current regulations allow the host country to limit each team to six pilots in the event that more than 80 pilots register to fly. So far this has not been enforced, but this year's event came very close. There were more than 100 pilots who filed preliminary entries, with the final count falling below 70 only in the week prior to the event. As the contest is likely to continue growing, we probably have to anticipate smaller teams for future events.

This year we had our first alternate, Steve Johnson, flying at AWAC as an independent. Everyone considered this to be a brilliant idea, as it meant that we had someone on hand to fill an official team spot in the event one of us had to withdraw—and this was possible even in the few days leading up to the contest. There were several aircraft difficulties, and two of us had to take last-minute flight medicals in a country that does not recognize some of the waivers that we allow in the United States. Steve flew incredibly well, by the way, placing 13th in the Q, and 24th overall. Clearly, a biplane will be rewarded with good scores if flown well.

The entry fee for AWAC is between $1,500 and $2,000, depending upon where it is held and the costs anticipated by the organizer. A contest in Germany or Sweden would likely cost more than in Poland (due to the low cost of services) or Las Vegas (due to subsidized rooms and food). The entry fee includes the contest, room, food, transportation between the airfield and the hotel, fuel and oil, any landing fees, and the various banquets. Not bad for eight or nine days in Europe, and even better when you figure it includes an aerobatic contest. Of course, the entry fee is

This wasn't just a group of pilots attending a contest in Poland. This was truly a world-class, professional, and cohesive team!

established for each contest and is likely to increase as fuel, insurance, and hotel costs escalate in future years. Generally, you can fly to anywhere in Europe, round trip, for about $1,000 or less.

An aircraft can be rented for $500 (my lowest) to $3,000, including some pre-contest practice and ferry time to and from the event. We've heard of amounts upwards of $8,000 being spent on exotic aircraft, but it still beats the snot out of $30,000 for round-trip air-freight for your personal secret weapon.

Incidental costs can be as little as $300 or as much as you want to spend. The big variable here is how long you want to spend practicing at the site prior to the contest and how big your entourage will be. I've done AWAC for less than $4,000 total (for my two highest overall results in 12th place), or this year's event, which was much closer to $10,000 (for my lowest overall result—there must be a message here somewhere). Of course, your mileage may vary.

In my humble opinion, the single greatest variable to performing well is maintaining a winning state of mind. If you go to AWAC, please remember that your teammates depend upon you and you upon them for a stable, content atmosphere. Prima donnas are not an asset, regardless of the size of their individual talent. The celebration of Rob, Jeff, and Hector's triumph was widespread and genuine, both within the US Team and among other participants. They provided proof that good guys do *not* finish last.

"Preparation is simple. Fly a lot! With that in mind, Jeff Boerboon and I planned to arrive to the practice site, Piastow airfield, several weeks early to get familiar with the new plane, overcome jet lag, get acclimated to the environment, and, maybe, spend a little time touring the country. It worked! We were relaxed and ready to fly by contest time. I believe the coming together of the US Team at Piastow in the days before the contest was valuable in getting the team 'tuned up' and getting the kinks out of the equipment."

Hector Ramirez

"At the top of my list, I feel, and it was commented on by many others at the event, that the US brought to Poland a cohesive integrated team, the importance of which cannot be overstated. No doubt exists that if we had the opportunity to fly the Unknowns we would have been even more successful. We critiqued each other during practice and the contest flying, and worked on each other's aircraft when the need arrived. It felt good to have teammates pulling for each other, and I was proud to be a part of this US Team."

Robbie Gibbs

M.E. Szper flyingfrog.com

Manager Julia Wood is known for keeping track of the team in the sky and on the ground.

Judy Abraham

Robbie Gibbs straps in for his flight.

How Do You Find an Aircraft to Compete With?

You can rent most AWAC legal aircraft in Europe. It helps if you have loaned or rented your aircraft to a visiting European in the United States, as what goes around comes around. Fortunately, sport aviation in Europe depends upon an aeroclub culture, so everyone is used to sharing aircraft. You may be required to get a local license or medical, but these are generally not difficult, time consuming, or expensive. At this AWAC everyone seemed to have settled upon a rate of $500/hour (wet) for aircraft rental, although some were quite a bit higher. In most cases, you can arrange for advance practice time at or near the contest site.

As the rules have evolved, and will continue to change, the list of legal aircraft has expanded. The strongest showing this year was from the SU29, an Extra 300, plus Rob's Ultimate 10-300. There may be a lesson here. Whatever aircraft you choose, you must be prepared to be better than the other pilots flying the same type. If you fly an SU29 or Yak 55, you will have to be better than the Russians and other eastern Europeans. There is no national team yet with extensive experience in the EX300, so this may be the smart call for Americans. The French seemed to be basing their future on the EX300, however, and whatever route they take will be to a high standard. On the other hand, if you fly the only Ultimate Biplane in the contest, your task is to be very good, which Rob most definitely was. The CAP231 is now legal, but could be hard to rent, and questions remain about its airworthiness. The Extra 230/Lazer is probably still a winner in the right hands, but not suited for adult-sized people like me. Zlin 50s are available, and economical. However, while they are easy to fly, they give up some presentation qualities to the more linear-shaped Extras, Yaks, Lazers, and Sukhois. With enough practice and perfection, they can still win, but it won't be easy.

It is difficult to say whether the improved performance of the new aircraft was a major factor in their success or whether the better pilots simply elected to fly the more capable aircraft. You will have to draw your own conclusions in this area. Still, Rob's Silver medal flying a biplane is strong evidence that it is the flying that counts.

"The greatest drama this year came from aircraft surprises. Mike and I reserved a Zlin with the Czech team last October, immediately after the Nationals. Two weeks prior to AWAC, they notified us that the aircraft was broken, and they could not find a replacement. A quick call to the Polish team found available spots on one of their aircraft, but when we arrived it would not start. As Polish aircraft maintenance usually begins with the search for a large hammer, I took over the job of repairing the magneto. Fortunately, my diagnosis and repair was right the first time, and we had little further trouble, until the warm-up pilot ground-looped our aircraft during his first landing at the contest. There were only minor scrapes on the wing tip, demonstrating the Zlin's ruggedness, but for a moment we thought we were out.

Even crazier was Todd Whitmer's attempt to fly an Edge 540T rented from a Swiss organization. He took the steps to have a written contract (most of this stuff just works on a verbal handshake) and to go to Switzerland two weeks earlier to practice in the aircraft. They were supposed to deliver it the week prior to the competition, and every day we were treated to the latest reason they could not make it. I have no position on the validity of these reasons, but at one point the two ferry pilots were reported to have been hospitalized for carbon monoxide poisoning, which pretty much ended any hope of the airplane showing up. In the end, Todd flew Alan Cassidy's mid-wing Extra 300 for the Q and the EX300LP being used by Jeff and Hector in the Free. His first experience with this airplane involved three wing wags, yet he still placed 16th overall, hinting at what he might have done in his preferred aircraft."

Don Peterson

"What a handicap it is to have an airplane with an unsymmetrical wing at the AWAC. With the other maintenance issues aside, we ended up spending too much time trying to fix something we could not. I will make sure that if I don't have my own plane at the next AWAC, I have one that will be competitive. I will also make sure I have enough time to get myself ready in that airplane."

Robbie Gibbs

At Home or Abroad, Aerobatics Is a Mental Game

The contest will last between seven and nine days and hopefully include four flights: the Q, Free, and two Unknowns. This contest was plagued by bad weather, so we managed only the Q and the Free, to everyone's great disappointment. Normally, the Q scores are discarded for the final result, putting a heavy emphasis on skilled flying in the Unknown sequences. When no Unknowns are flown, the Q and Free are combined for the final score.

If you practice prior to the contest and draw an early number for the Q, you may wait several days before you fly again. Meanwhile, there will be

interminable briefings, team meetings, rain delays, jury rulings, wild rumors, gastrointestinal amusements from eating strange gelatinous food, and late nights out experiencing the local social scene. All of this can wear you down prior to those critical six minutes in the box, and there are no "do-overs" at the championships.

"It is important to stay focused throughout the contest. Don't let the distractions like weather and maintenance problems throw you a curve ball and break your rhythm. Another lesson learned included: 'You don't have to change your flying to fly international competition.' The judges seemed to like different flying styles and gave good positioning scores as long as the utilization of the box was well thought out."

Robbie Gibbs

"I can best describe my first AWAC experience as a lesson in patience. Things move at a snail's pace compared to a US contest, but at the end of the day we accomplished what we intended to do, barring weather, of course. The field is large; this year there were 64 pilots from 20 nations, and the quality of flying was very impressive."

Mike Gallaway

Flying to Win at AWAC

Just like in the United States, everyone has their own take on what scores well and what represents the highest expression of our art form. Some people would prefer to think of what we do as an engineering exercise, with only precision and angles defining the winner. As the participants at this AWAC observe, this is as much a "flying display" as it is a demonstration of precision. Yet, it is hard to pin down the winning formula. It may well be different for each pilot, aircraft, time of day, weather conditions, and specific judges on the line. When you have 70 pilots, it probably helps to have something unique about your presentation, yet still fly the elements to perfection. Good luck in the selection of flight order and weather conditions could well be the trump card. Not an easy job…

When writing about the 2006 AWAC, we have to mention the good or bad fortune of flying only a Q and Freestyle, with no Unknowns. When you spend a year preparing for a world contest, inevitably you work on a variety of things in the hope they will be the ones that matter at the contest. This is the first time that the Q flight has counted toward the final scores, so it has been tempting to view the Q as something of a toss-off and concentrate on one's Unknown skills. It's hard to argue with that. Yet, as we just experienced, scoring well in the Q made a lot of difference, plus the benefit of being at the end of the flight order in the Freestyle. I would never suggest that the ability to fly Unknowns is anything less than critical, but would encourage future pilots to prepare a brilliant Q flight. It certainly can't hurt, and it may represent half of your final score.

Judy Abraham

Todd Whitmer studies the sequence and hopes for clear skies.

"Appropriate preparation before departing the USA provides the groundwork for success. Good critiquing and training is key, and for this I was fortunate to have Nikolay Timofeev as a coach. I believe good, consistent flying gets rewarded no matter what the style, as evidenced by the success of the aggressive, in-your-face US flying versus the methodical, high-in-the-back-of-the-box Russians or the more measured, framed presentation by the French team."

Hector Ramirez

"There is more of an emphasis on presentation than perfection at a world contest. This competition I flew more with the mindset of 'presenting' the figure as

While in competing in Poland, several US Team members took time to update their fans via the internet. Don Peterson later looked through those updates, talked to the team, and shared some thoughts about AWAC. Thank you Don and the US Team for sharing the view from the cockpit.

opposed to 'flying' the figure. And I think it worked. I structured my Free to be in the judges' faces at all times."

Rob Holland

"As far as flying style goes, I could not perceive any bias from the judges one way or another. At the end of the day, good flying simply wins. You do need to nail your rotational elements (no bobbles, etc.), and you must fly with a bit more assertiveness, sharp corners, sharp point rolls etc. Otherwise, I would say the judging criteria are very similar to the United States'. This is just my opinion, however. Also, the old notion that biplanes can't win was shot down rather adamantly, as Rob Holland and Steve Johnson proved to all of us, and the world, that biplanes still rule!"

Mike Gallaway

"The level of flying skill was amazing, but the really amazing things were the types of Freestyles put together, not just to get the required figures in the sequence in a way that doesn't lose too much altitude, but to show the airframe at its best. At the AWAC, the good Frees 'flowed' like a good airshow sequence, showing the figures while also keeping the interest of the judges, and also entertaining the judges like an airshow flight."

Steve Johnson

"Flying deliberate, clean, crisp, consistent, and predictable elements centered on straight lines is the key in international competitions. Sometimes we in the US spend more effort polishing the line angles, like 45 degrees versus 43 or 47 degrees, instead of crisply entering the snap, keeping the rate constant during the entire rotation, and crisply exiting the snap. The judges seem to be watching these elements, centered on the line, more intently than the line itself."

Julia Wood

The Long-Term View From Over the Shoulder, Looking Back

We have small regional contests, large

regional contests, the US Nationals, and AWAC/WAC as a natural progression for our competing IAC members. AWAC (and the similar AEAC) might be viewed as equivalent to our US Nationals, but for advanced only. Yes, a world title is at stake, but the expense, time required, preparation, aircraft, and recreational value are quite similar. It is a contest that the typical IAC member can aspire to attend. My experience at the 2003 AEAC showed that Americans are quite welcome, even though we aren't eligible for the trophy. A great contest experience if you plan to have a go at AWAC.

It is no great insight to predict that AWAC will continue to be a successful exercise. It has hit a sweet spot in the world aerobatic scene. Part of this must be because every attending nation has the reasonable expectation of winning an individual or team medal. Clearly, hosting the contest in the United States would improve our chances of winning the gold. We have the airplanes, infrastructure, airports, and money to make it a huge success, but do we have the will to go for the gold, and to participate fully in this world sport? In this writer's opinion, our board should commit our club to host the AWAC in the United States at least once or twice a decade as part of its duty to foster and enrich the aerobatic experience available to our members.

"This Advanced World Aerobatic Championships was my second time at a world-level contest. I learned many lessons from the 2004 contest held in Sweden and spent the last two years preparing myself based on lessons learned to have a more successful contest in Poland. Robbie, Todd, and myself worked together at the 2005 US Nationals for the team selection. By working together we were able to help each other make the team. We finished first, third, and fourth in team selection and started a campaign to make AWAC a team event.

"This contest took a great effort on the part of many people, and I was fortunate to have the support of many friends and family, and this would have never been possible without their support. I would like to offer a very special thank you to my wife Maria, my biggest fan and greatest supporter."

Jeff Boerboon

M.E. Szper flyingfrog.com

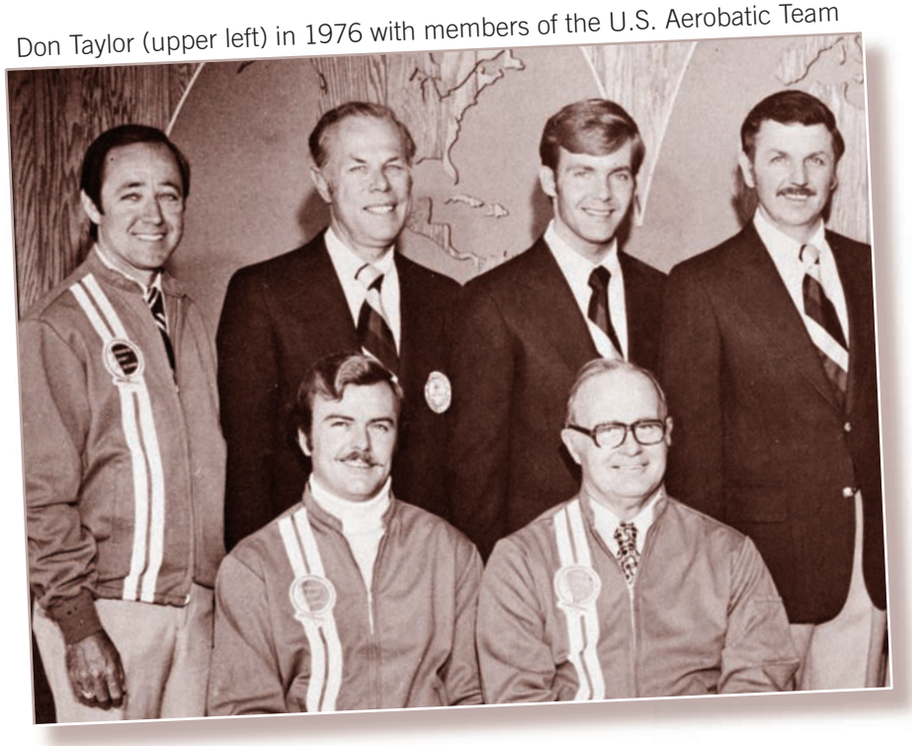
Don Peterson and other members of the US Team took time to keep stateside fans up to speed through email messages and photos. (Photo courtesy of Don Peterson)

"When the contest started, life intervened. The weather turned ugly just before the contest began, putting a significant damper on the flying, and limiting the competition to just two flights. Worse, the Edge that had taken so much effort to arrange got stuck in Switzerland…I wound up flying an Extra 300 and then an Extra 300LP in the Known and Free flights. Although I scored respectably, the quality of the flights was not what I had envisioned and practiced for all those months. Frustrating and disappointing, certainly—and yet, when I look back on the past year, preparing for and competing in the AWAC has truly been a very special life experience. I better understand the wisdom of the old adage that the journey is more important than the destination."

Todd Whitmer

Everyone has their own reasons for participating in this sport. For some, it is the single-minded drive to win, and for others it is the people and socializing. Many of us strive for something in between—a balance of personal growth, testing ourselves against a high standard, while having a grand time playing with cool airplanes, doing exciting stuff, making new friends, and experiencing exotic places. You can find all this at AWAC, and don't let anyone tell you otherwise.

Don Taylor (upper left) in 1976 with members of the U.S. Aerobatic Team



Special Guest Reflection:
Don Taylor shares the early days of IAC

"That all changed when Curtis Pitts put a 180 Lycoming in the front of one of his aircraft with symmetrical airfoils and ailerons on all four wings."

Editor's Note: After featuring Mike Heuer's tribute to his father in August 2006, "Remembering Bob Heuer, a life in aviation and aerobatics" Sport Aerobatics and Mike received several appreciative comments from the aerobatic community. One of those comments came from Don Taylor, IAC 3 and one of the early aerobatic pioneers that shared Bob Heuer's vision to create an enduring aerobatic organization.

By Don Taylor, IAC 3

Mike Heuer has done an excellent job on the article about his dad ("Remembering Bob Heuer, a life in aviation and aerobatics," *Sport Aerobatics,* August 2006) and my old friend Bob Heuer. I'd just like to add a couple of comments about what happened back so long ago.

First, regarding the contest in Ottumwa in 1965, Mike is right. Dick Lybarger and Bob Lyjak flew in that contest…and so did I. I flew my clipped-wing Monocoupe, N-15E, with a 200 Warner engine and an Aeromatic prop in the "pro" category. The chief judge for the contest that Dick Bach organized that year was Frank Price—Mr. U.S. Aerobatic Team himself from 1960! I was in heaven just listening to Frank talk at the pilot briefings. Frank really liked to talk.

The contest was otherwise as Mike explained it, and Bob Lyjak won. Dick Lybarger was killed in his Stearman a couple of years later. Lyjak is still around and was an air show star in his Taperwing Waco for many years at the Oshkosh fly-in. I, too, am fortunate enough to still be around.

One of the little-known reasons there were aerobatic contests at the Antique Airplane Association convention and none in Rockford in those days was because EAA had a policy against aerobatics in homebuilt aircraft. That was a good policy as it didn't want to jeopardize the homebuilt movement because of accidents. This didn't matter in the early/mid '60s, though, as none of the homebuilt aircraft were much good for aerobatics. That all changed when Curtis Pitts put a 180 Lycoming in the front of one of his aircraft with symmetrical airfoils and ailerons on all four wings. After that, the roundwing, four-aileron Pitts was the standard by which all other aerobatic aircraft were judged. I can't tell you how many times I have heard someone say, "It's a good airplane, but it doesn't fly like a Pitts." I was just completing a highly modified Great Lakes in the spring of 1970, and Bob let me fly N442X, which was the first Pitts I had flown. Although I loved my Great Lakes, I knew after that I would have to have a Pitts some day.

A slight correction on the decision to form the IAC. It did originate out of the National's contest in 1969 at Pappy Spinks' Oak Grove Airport. I was a judge at that contest, just as I had been in 1967 and 1968, and a member of ACA. The Aerobatic Club of America membership meeting the

Monday after the contest, however, left many of us disappointed with that organization and determined to make some changes. Over dinner that night in a restaurant called the Zuyder Zee, and after several beers and many plates of shrimp, the decision was made to build a new organization. Gail and I were there along with Bob and Martha. Ask your mom, Mike; she will remember. Bob and I talked a great deal more about this on the flight back to Chicago the next day. We were all four on the same American Airlines flight.

Our first meeting with Paul was just after EAA had accepted an offer from Steve Wittman to move the EAA fly-in from Rockford to Oshkosh. The reaction we had was, "Where can we have an aerobatic contest?" Fond du Lac it was, and so it remained for many years. After an initial reaction of, "You want to do *what* at our airport?" Will and Loraine Haas were the perfect hosts for the early IAC competitions, and a mutual love affair between aerobatic aficionados and Fond du Lac blossomed.

I still remember the early discussions of our name. International sounded awfully grand for an aerobatic club that had less than 100 members and only $500 in the bank. Ray Scholler and his Times Printing Company carefully handled EAA funds, lent to us by Paul, to publish our first rule books. Without this kind of help, we probably would not have gotten the organization off the ground (you will pardon the expression). We finally decided it was an international organization because EAA was, and we were to be its first division. Having a few members from Canada (like Jerry Younger) certainly helped.

One final comment. Remember that ACA had three categories: Primary, Advanced, and Unlimited. We thought there was too much of a gap between Primary (a name we didn't much care for so we changed it to Sportsman) and Advanced and set up a fourth category. We thought for a while and no one could come up with a very good name, so we labeled it Intermediate. I remember thinking at the time that that name would surely get changed in a few years. What an unimaginative name, surely someone would do better than we had! Well, I'm sorry. It's still around all these years later. I still have the trophy for winning first place (there was not a lot of competition) in the first Intermediate contest. I flew that contest, The Mid America in Aurora, Illinois, in my Great Lakes.

Through all of the efforts of getting the IAC up and running, it was Bob Heuer's energy and determination that kept us on track. He was a good leader and the first president of IAC. Although we didn't always get along, it was always obvious that Bob wanted the best of everything for the sport of aerobatics. I enjoyed being the vice president and the exciting early years as we saw the organization grow…and the EAA fly-in along with it. Thanks for the memories, Mike.

A member of the IAC Hall of Fame, Don Taylor is currently the vice president of flight operations, safety, and training for Eclipse Aviation Corporation. Don retired from United Air Lines as a B-747-400 captain and was the chief judge at the World Aerobatic Championships in Le Havre, France, in 1992.

So, You Want to Buy an

You just can't take it any longer. You're either stuck on the ground or, worse yet, you're droning along straight and level while everyone else is having all the three-dimensional fun. And on top of that, they are becoming better pilots while you're perfecting your version of status quo. The time has definitely come for you to buy your own aerobatic bird.

This is no small thing. In fact, it falls into the "momentous" category and is loaded with opportunities for your "wants" to overpower your "needs" and to make decisions with something less than your usually clear head. This whole endeavor takes a lot of thought, and when the desire is strongest and you've decided to go for it, your first move should be to take a cold shower and give your checkbook to someone much larger than you are, with instructions not to return it regardless of how much you whimper. Or give it to your spouse, which accomplishes the same thing.

There's an order of analysis here that definitely does *not* start with the hardware. In fact, which airplane to buy is the last and simplest thing on the agenda. You need to get life's other ducks in a row first.

Every life is made up of a bunch of different and usually overlapping segments, each of which has its own requirements, responsibilities, and pressures. There's the spouse, the kids, the house, the job, other interests, your geographical location, the local weather, local airports, and the local attitude toward airplanes in general. And, oh, yeah, we can't forget finances. Like we said, which airplane to buy is one of the very last things to be analyzed.

As a hedge against emotion-blurred decision making, we've developed a little checklist that might help in guiding your thoughts during this critical episode in your life.

Factors to Be Considered

Why do you want an aerobatic airplane? Think about this really hard: Why do you want an aerobatic airplane? Do you want to go out on a nice Sunday afternoon and flop around a bit, or are you thinking about competing? Or, even if you're not competing, how serious do you want to get with your aerobatics? Do you really want hard-core outside capabilities? Or maybe you just want the option of doing a roll now and then to spice up your flying.

Christen Eagle

Time constraints. When you're out there perfecting your hammerheads, that time is coming from somewhere. There is no such thing as "free" time. There is just time that you've decided to invest in flying rather than doing something else. If that "something else" includes things like fixing stuff around the house, going to little league games, attending young Scott's class picnic and other family-oriented activities, your time with your airplane could cause problems that can't be fixed with a wrench. And how does your job time overlay your family time?

The good news is that an aerobatic airplane fits into a crowded lifestyle better than most: a quick dash to the airport, 45 frantic minutes in the air, and a quick dash to where you were really supposed to be. The actual act of doing aerobatics isn't usually a deal breaker in a family situation, because it takes small chunks of time. However, if competing is one of your goals, it's an entirely different matter.

Financial aspects. Airplanes aren't cheap, but if there's some utility to them they can at least be rationalized ("Honest, we can use it to go to Grandma's house"). Except for a few multiuse machines, aerobatic airplanes, no matter how hard we try, can't be rationalized. So are the finances there to support an irrational activity? Again the family enters in: If an irrational toy is going to place financial burdens on an otherwise rational family, resentment will grow until either the airplane or the spouse leaves. If it gets to that point, it's generally both. Do not underestimate the impact of buying such a high-profile toy on the family, espe-

AEROBATIC Airplane?

By Budd Davisson

cially a single-place toy, since there's no way the "me" factor isn't going to be obvious.

Environmental considerations. Among other things, just finding a hangar can be a huge problem, never mind the expense. And what about the local aerobatic area? Is there one, or do you have to fly 20 minutes just to get off the airways? And is the off-airway area over hostile territory with lots of folks to complain about you? If there's no place to practice, an aerobatic airplane does us little good. And what about the weather? Do you get akro-capable weather only a few days a week, one of which seems to always fall on Wednesday?

Think about all the foregoing and really do a hard analysis of how much time you'll actually have to fly your airplane. If you fly it twice a week, you might put 100 hours a year into it, which is very high time for an akro airplane. Thirty-five to 50 hours a year is more likely. Now put all the costs and aggravation against that time and see if it is worth it. Only you can make that decision. For many of us, even if we seldom fly it, just knowing the airplane is there waiting for us is worth it all. But that's your call.

Incidentally, there's one serious, never-to-be-violated rule of owning an aerobatic airplane: Don't *ever* sit down and figure out how much it costs per hour to fly it. Some costs in life are better left unknown.

Partnerships—The Solution to Aerobatic Costs

The aerobatic airplane, more than any other form of flying machine, is a perfect nucleus for a partnership.

Cessna Aerobat

Airplanes like Clipped Cubs and Pitts never go anywhere. They can be scheduled on an hourly basis and not interfere with each other's plans.

Forming an airplane partnership does the obvious: it cuts the cost of owning down to the point that it's not only survivable, but in some cases, downright affordable. Be advised, however, that some insurance companies have a limit to the number of partners it will insure without considering it a club, which puts it into another insurance arena. Five is the most common limit.

Picking partners in an airplane is a subject worthy of an entire book, but bear in mind that you can always make a weak pilot stronger. But if he's a jerk, you aren't going to change that and you just have to live with it. The following are items to think about when selecting partners:

- Financial responsibility—they don't have to be bucks up, just responsible.
- Flying skill or the willingness to get dual until they have the skill.
- Consideration for others in both scheduling and how they treat the airplane.
- A generally professional attitude toward flying and the partnership.

Items to think about when writing the partnership agreement:

- Include a distinct buy-out clause in the agreement.
- A deal-breaker clause: You do this and you're out. This protects members from one another's actions.
- List of personal responsibilities.
- Shared cost breakdown and penalties for not meeting it.
- Make it an LLC to limit liability.
- Get insurance requirements before forming the partnership.
- Set proficiency standards: If you don't fly for 30-45 days, you take a ride around the patch with another member or a type-qualified CFI.

The Hardware Decision

Yeehah! We finally get to talk about airplanes. In making the decision of which airplane to buy, all the foregoing should be in the back of your mind, but consider the following as well:

- Two-place airplanes have the

Piper Clipped Cub

added advantage of possible utility and sharing the experience with friends and family.

• Some airplanes, e.g. Pitts Specials, demand more of their pilots and proficiency, so the amount of time you can devote to flying becomes more of an issue.

• Acquisition prices range all over the block and don't necessarily reflect the airplane's capabilities. For example, a $20,000 S-1C Pitts will blow the doors off a $35,000 Citabria when measured on an aerobatic scale, but won't compare in other areas.

• Don't buy more airplane than you need or that you can stay proficient in; owning an S-1S Pitts is fun, but if you know you're going to fly only once a month, maybe a clipped Cub or Citabria would scratch the itch in a safer, less intense manner.

The Airplane Options

We're going to limit this discussion to entry-level airplanes, which definitely do not include Extra 300S, Sukhoi 26s, and similar super ships. We figure, if you're looking at that kind of iron, you're already well ahead of this discussion.

Cessna Aerobat The Cessna Aerobat is the subject of a lot of derisive comments by some in the aerobatic community, but the truth is, an Aerobat will do everything a Citabria will, but doesn't require a tailwheel endorsement. Also, if a person is looking for a no-sweat, multipurpose airplane, this is it. The airplane also has the advantage of being a totally familiar environment to generations of pilots, so the only new factor is the aerobatics itself.

The Aerobat is not without its shortcomings, some of which have to do with cockpit dimensions: this is not a big-guy airplane, and it performs best when lightly loaded. Because of this, the airplane really teaches energy management, since the engine isn't helping you. There are minor engine hop-up packages that take it up to 125 hp, and the seemingly small increase is noticeable.

Oddly enough, the airplane doesn't have a reputation for breaking things, while other, better recognized aerobatic airplanes break stuff all the time. This says something in itself.

Skybolt

Citabria The Citabria also comes in for its share of jokes, but modern aerobatics started with the Citabria in the early '60s and is still where the last couple of generations of aerobatic pilots got their start. This is probably the most common entry-level aerobatic airplane, and it's a good choice.

The Citabria comes in a bewildering array of models and power plants, but all of them offer some utility as well as aerobatics. They are good Sunday afternoon goof-around airplanes in that they are comfortable two-place airplanes that can actually be used to go places. The backseat is comfortable and offers great sightseeing vistas, and this is not to be underestimated when considering a family airplane.

Although a taildragger, it's about the most benign of the breed, and six hours of dual will make almost any nosedragger pilot comfortable in it. It has the added advantage of having lots of qualified instructors around for it because it is so common.

The airplane is probably best categorized by horsepower and whether it is a first-generation airplane with wood spars or a later version with metal spars. Wood spars have recently become worrisome in that enough have developed cracks that they require an intense pre-buy inspection by someone familiar with the airplane. He will be looking for cracks that develop lengthwise in the spar at the outer strut attach points. If the spars check okay, they are not to be feared. Wood is an excellent spar material (ask Pitts pilots if you don't believe that), but it is an organic material that has to be checked periodically.

The Citabrias were produced with 100, 115, and 150 hp, with the 100-hp versions being the very early models and seldom seen. The 115-hp 7ECA is common and much less expensive than the 150-hp (7GCA) airplanes. The small-engine airplanes require lots of climbing and diving to build energy for maneuvers, but they'll still do great aerobatics. The 150-hp airplanes don't actually perform the maneuvers any better than the 115-hp airplanes do, but the climb rates and ability to hold altitude put them in an entirely different class.

The fuel-injected 7KCABs with inverted systems let you do true slow rolls, but flying inverted is a chore because of the flat bottom wing and your need for a long right arm to hold the required nose-up attitude. Citabrias in general, even those equipped with spades, need more shoulder/arm

strength than most other commonly available aerobatic airplanes, but they'll still do most of the maneuvers and are a barrel of fun.

Decathlon (8KCAB) Although derived from the Citabria, the Decathlons are a different breed of cat. They were designed specifically to deal with the Citabria's limitations when it came to outside maneuvers. The original 150-hp Decathlons, even though equipped with constant-speed props, give up some climb to the 150-hp Citabrias simply because flat high-lift wings climb better than symmetrical wings, all other things being equal. The 180-hp birds leave them behind.

Like the Citabrias, the Decathlons have their share of airworthiness directives, so check their logs carefully if buying one. The Decathlons fly much better inverted than the older airplanes and, in fact, do everything better and easier. This is especially true of the newer Super Decathlons that have even gotten the aileron pressures down to the levels that rotator cuffs aren't endangered. If you can afford a new airplane and are looking for a multitask airplane that does good aerobatics, you can stop looking when you hit the Super Decathlon.

Christen/Aviat Eagle So many Eagles have been built that they outnumber many factory-built aerobatic airplanes. Although a more specialized airplane, by virtue of its relatively large cockpit, people-friendly ergonomics, and cruise speed, the Eagle can still be considered more than strictly an aerobatic airplane.

Although a homebuilt airplane, they are all built from the same kits, so the breed is more homogeneous than most homebuilts, although care should be taken to ensure the systems are done correctly.

From an aerobatic point of view the airplane closely resembles a Pitts S-2A, although there are subtle differences. This means it's a fully aerobatic airplane and can do almost any maneuver in the Aresti catalog; it just won't do them as well as the unlim-

Great Lakes

ited birds. The airplane is more comfortable than a Pitts, and its spring gear is slightly more forgiving on the runway, although not quite as honest in a hard crosswind as the old V-gear. These, however, are nuances hardly worth discussing.

Great Lakes There are two categories of 2T-1A Great Lakes biplanes: the original antiques and the later airplanes built in the 70s with 180 Lycomings. These, too, come in two versions: those with two ailerons and those with four. The four-aileron versions are greatly preferred because of their increased roll rate. Only the newer airplanes would fit into what we're defining as entry-level aerobatic airplanes.

Although they give up vertical performance to the Decathlons, the Great Lakes will do most of the same maneuvers the Decathlons will, but with more work and, in most hands, with more altitude loss. Their higher drag and lower power-to-weight ratio hurts them in the vertical. Their rudder ergonomics automatically make those with long legs uncomfortable, but on the runway they are super easy.

The Great Lakes has the advantage of being a true "character" airplane, so you can treat it as an antique but know it's actually modern.

Piper Clipped Cub The Clipped J-3 Cub is the most under-rated "fun" airplane in the aerobatic catalog. An STC'd modification to a stock J-3 Cub (40-1/2" is cut off each wing root), the airplane will outperform a Citabria with much less effort and infinitely more enjoyment factor on a fraction of the horsepower. The best combination is a super-light Clipped Cub with a stout C-90. If you work it really hard, you might burn 6 gph. These days, that's cheap fun.

Unless specially modified with an inverted system, which usually takes it out of the standard airworthiness category and puts it into Airshow/Exhibition, the Clipped Cub is an inside-maneuvers-only airplane, but it'll do them all just fine. Its narrow cockpit is tight for big guys, but leg room isn't usually an issue.

At 90-95 mph cruise, this is primarily a local-area airplane, but one that can be bought and flown for a reasonable dollar. The acquisition costs vary all over the block depending on the engine (don't get anything less than an A-75, and the C-85 is preferred) and whether it's a super-slicked-up

Pitts S-1

show machine. This airplane is nothing but pure fun with wings.

Pitts We could just say "Pitts Special" and stop right there; nothing else needs to be said. The Pitts *is* aerobatics, and there are so many variations on the theme within the breed that you can spend what you want and get what you want, from bargain-basement fun to high-buck – not-quite-unlimited performance.

Single-Place Pitts

S-1C The original Pitts with the relatively flat M6 airfoil is probably the most airplane for the least amount of money in sport aviation. You can buy a good one for $20,000, and you'll see lots at two-thirds that rate, but inspect all of them carefully. These are all homebuilts, and their quality and craftsmanship varies greatly. There are also two fuselage lengths with the extra 3 inches in the cockpit being welcome. The 160-hp S-1C may be the perfect aerobatic fun machine, and the 180-hp versions give you a permanent grin. The airfoil limits them on outside maneuvers, but only in a competition environment. From the cockpit the maneuvers look and feel good.

S-1D Same as above, but with four ailerons.

S-1S The "round wing" Pitts was, and is, a very serious aerobatic airplane that the average person can buy and fly knowing he'll probably never get as good as the airplane is. You can start out treating it as a sport airplane for Sunday afternoon giggles and work your way up to doing battle with the big boys. Not all S-1Ss are created equal, because, among other things, Curtis didn't release plans for it until *after* Aviat stopped building them in the early 1980s, so any S-1S built before that date, assuming it isn't a factory-built airplane, isn't a true S-1S and probably has Sparcraft wings. This isn't a bad thing; they are just a little heavier and still fly like crazy. Incidentally, the single-place Pitts is not as hard to land as everyone would have you believe. However, it's essential you get good training before launching in *any* Pitts Special.

S-1-11B Super Stinker Can we say "homebuilt rocket ship," boys and girls? The Super Stinker homebuilt is more airplane than most people need and certainly not an entry-level airplane, but we just thought we'd mention it as something to shoot for.

S-2S Factory-built, 260-hp, single-place version of the S-2A. Amazing performance and handling.

Two-Place Pitts

S-2A Factory-built two-place with 200 hp, constant speed. Terrific sport airplane and more capable than the big-engine guys think it is.

S-2B Factory-built, 260-hp two-place, most readily available of the breed. Some are getting long in the tooth and may need recovering. Approach any Pitts with care in this regard, as a cover job will run at least $20,000.

S-2C The Aviat S-2C Pitts is the current production two-place, and it's really a missile masquerading as a biplane. This is much more than a warmed-over S-2B, with new wings and tail that give much more balanced aerobatic handling and wildly improved roll rate. Both the B and C are fast enough to be considered good cross-country machines, if you don't mind landing every 250 miles and can get used to having no visibility over the nose.

Skybolt Lots of Skybolts have been built and are available for a reasonable dollar. Because they are homebuilts, they require careful inspection. Pay particular attention to how big the gap is in the ailerons, as that greatly affects their roll performance. Consider the airplane a fat S-2A Pitts, as a light one will do almost as well in aerobatics. This is a good alternative for a big guy looking for a combination sport and aerobatic airplane.

Zlin 242 The Zlin is a 200-hp, side-by-side airplane that is as useful for touring as it is for aerobatics. It's a little heavy for the engine but still does good aerobatics, and in typical European handling form it requires you pay attention to the rudder more than in most other airplanes previously mentioned. This is, however, the only aerobatic nosedragger besides the Aerobat that is commonly available.

Honorable Mentions Just to reduce the number of letters, we'll mention the aerobatic Bonanzas, although they are so rare and sought-after, they are hardly entry-level airplanes. We'll also mention the Yak 52 as another nosedragger capable of excellent aerobatics, but this is as much a warbird as it is a sport airplane, so it's in a different class.

We hope we haven't confused you with too much information, but this is only the tip of a very big, fun-loving iceberg, so soldier on and we'll see you in the practice area.

Zlin 242

Dear *Sport Aerobatics*,

I strongly disagree with Budd Davisson's comments on the Cessna Aerobat in the July 2006 issue (Floppin' for the Fun of It).

As a flight instructor of 57 years and 3,500 hours of teaching aerobatics in the Aerobat, I find that it is the *best* airplane for the introduction of upset training and aerobatics for the average pilot. It's a nose-wheel-equipped, side-by-side, low-powered airplane that teaches energy conservation and so is best for the pilot who has been flying this type of airplane. I've had more than 660 people take the introductory aerobatic course and another 400-plus take the spin course. I used the Aerobat for three summers teaching spins at the Navy Test Pilot School.

For fun (and at altitude) I do square loops, eight-sided loops, four- and eight-point rolls and teach CFI candidates a 20-turn spin plus spin recoveries using the elevator or ailerons (wheel full back). Spin recoveries on instruments is also part of the course.

Some of my students go on with aerobatics, and I encourage them to go on to Pitts and Extras. Hector Ramirez was introduced to aerobatics in the Aerobat here, and he's competing in Advanced this summer in Poland.

I always enjoy Budd's writings on anything, but I had to defend the little airplane which is fun but no Extra.

Hals und beinbruch,

Bill Kershner

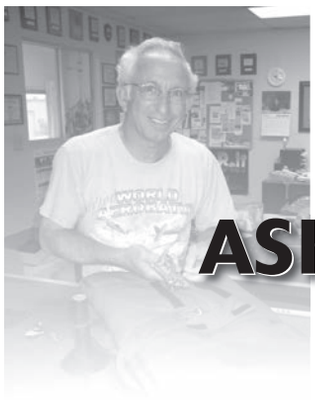
Dear Bill:

Wow! A letter from one of my heroes! Considering that you're the absolute leading exponent of the Aerobat, I'm not surprised we received your note.

Reread what I said about the little airplane. " … This nosewheel baby carriage has the advantage of providing basic aerobatic training in a familiar environment. It is performance-limited with either too much weight or density altitude. Actually, it's performance-limited, period, but it still gives good training."

I think you thought I was calling one of your kids ugly, when all I meant by "performance-limited" was it doesn't climb well when it's hot or loaded. I'm from Phoenix, so we notice that kind of thing. I should have picked my words more carefully. And I don't disagree with a single thing you've said about the airplane. So, I guess we agree. Friends?

BD



ASK Allen

A master rigger answers your questions about parachutes

Q. *Allen, in my part of the country we already had our first frost! How do I store my parachute for the non-flying months when I'm skiing?*

A. First, make sure you keep your parachute in a cool, dry area off the floor or ground. By the way, this advice applies all of the time, not just during the off-season. Many pilots have lockers in their hangars or garages. These may be fine, but many of them have air vents that can allow mice and other vermin to enter. You do not want to take your parachute from your locker and find it all chewed up! If you do not already have a carry bag for your parachute, purchase one as your first line of protection. Then, buy a plastic storage container with a snap-on lid to keep all the critters out. Many of these are about the right size for a parachute, and some even have wheels on them. Purchase a few desiccants to help absorb any moisture and toss them in the box with your parachute. Also, getting ready for storage provides a great opportunity to see the inside of your pack. Since your parachute will need a fresh repack for the start of your flying season, why not pull the ripcord for practice? If you are going to store your parachute longer than six months, remove the lines from the rubber bands and then remove the rubber bands from the parachute and toss them out. Over time the rubber bands will deteriorate and stick to the lines and parachute material like glue, ruining your parachute.

Q. *I heard a friend of mine say they received an airworthiness directive for their parachute. Is that possible? I thought that service bulletins and airworthiness directives were issued only for aircraft. If there is such a thing, how do I find out about it?*

A. The simple answer is that your friend is probably telling the truth. Parachute manufacturers will occasionally uncover a defect or discover a better way to do something and will issue corrective action in the form of service bulletins and airworthiness directives. Manufacturers may publish this information in trade publications. Your parachute rigger should be aware of these. However, many parachute riggers work part-time and do not receive current information regarding SBs and ADs in a timely fashion. It is not uncommon for the rigger to find out from other riggers or even the owner! However, this is not an excuse for not knowing. Parachute riggers should have in their possession current packing manuals and all supplements. Most manufacturers have them online. You should ask if your parachute rigger has the current packing manual. If not, insist the rigger call the manufacturer or go online and get one before packing your parachute. If you have any doubt in your mind, call the manufacturer and ask for the date of its most current packing manual for the parachute you have and if there are any SBs or ADs. Just because your rigger has been packing your parachute for years does not mean he or she has the current packing manual. Usually, if there are changes, they are minor, but that is why you have your parachute repacked. You want to make sure when it is returned you have all the latest bells and whistles, and that means your rigger has to know exactly what needs to be modified, removed, or installed.

"Over time the rubber bands will deteriorate and stick to the lines and parachute material like glue, ruining your parachute."

In closing, I have a request for you. Sport Aerobatics magazine is going through a makeover, and this column is part of that effort. I'm open for suggestions, and I definitely need your questions, so keep them coming. Thank you.

Allen Silver is the owner of Silver Parachute Sales and is always available to answer your questions about parachutes. Send your questions to ***Allen@silverparachutes.com.***

Take Off to the Great White North

IAC Chapters 35 and 52 lead U.S. invasion of Canada

By Weston Liu

Weston Liu makes his way across the Canadian border to compete in Montreal.

For IAC members in the Northeast United States, you don't have to fly to Europe to find international aerobatics. A short hop across our northern border to the Montreal Acro Challenge will put you where the primary language on the UNICOM is French, the currency is loonies and toonies, fuel is pumped in liters, and they don't accept MasterCard for avgas. Last August, Aerobatics Canada Chapter 2 and St. Hyacinthe Airport owner Gabriel Chartier hosted a two-day aerobatic extravaganza. The U.S. visitors learned that while the number of aerobatic competitors in Canada is small, they are enthusiastic and warm hosts. Contest Director John Wyman organized all of the people, equipment, food, hangar space, and operations that make a contest successful. Chief Judge Carol Holyk and Registrar Donna McLachlin drove in from Toronto. Larry Ernewein flew a Bücker Jungmann from Toronto to compete in Sportsman. Flying from Toronto to Montreal is comparable to a flight from Philadelphia to Boston. That makes for a long hop in a slow biplane.

For Americans, flying to Canada turns out to be pretty easy. Flying an FAA aerobatic category or experimental amateur-built airplane does not require any advance notice or paperwork. A Sukhoi or Yak experimental exhibition aircraft will require a month advance notice and a fee, but our Aerobatics Canada hosts will offer to waive the contest registration fee to balance this out. File your flight plan, call 888-226-7277 two hours before you go, and launch! Before you go, remember to stop by the AAA office and get some traveler's checks denominated in Canadian dollars. Coming back is only slightly more difficult. You have to telephone the customs office (look for the telephone number on the Internet) at the airport where you will re-enter the United States to tell them your time of arrival and answer some questions. If you call about an hour before you plan to arrive, you should be fine. NavCanada Flight Service at 866-992-7433 (note 866 not 800!) is happy to take your flight plan. Quebec Radio and Montreal Approach will open your flight plan and provide a transponder squawk code and flight following to the United States. If you are going to Burlington, Vermont, Burlington Approach picks up your squawk, clears you into the Class C airspace, and you are home!

Saturday brought blue skies and light winds quartering from the opposite direction of Friday, forcing the pilots to turn around their mental picture of the box.

This year, we had members of IAC Chapters 35 and 52 attend the contest. From New York or Boston, Montreal is within two hours of Pitts' flying time. Our International Aerobatic Club sanctions these contests, so we all got credit toward judging, assistant judging, and regional series standings.

There was no way for pilots to miss the starter, Francois Bougie.

Practice Friday challenged the competitors with stiff winds in the box directly at the judges' line. Afternoon thunderstorms threatened but passed by north and south. For dinner our hosts grilled steaks from what seemed like an entire side of beef, and over beer we tried to figure out winning strategies for defeating the wind and staying in front of, not drifting behind, the chief judge. Saturday brought blue skies and light winds quartering from the opposite direction of Friday, forcing the pilots to turn around their mental picture of the box. After John Wyman conducted the contest briefing, the starter, Francois Bougie, began launching flights. I should note that the French Canadian idea of contest fashion motivated Francois to wear bright yellow shorts, a yellow jersey, and a yellow hard hat with a model biplane glued to the top. Only a competitor with severe vision problems could avoid seeing him coming to launch you.

On Saturday night, local pilot Marcel Deschamps donated his hangar and food for a barbecue. We consumed burgers, dogs, and beer while digesting unknown sequences that seemed to be 90 percent down and outside figures. The hot topic was where to take a break so as to avoid going to sleep. On Sunday morning we were greeted by the sight of a hot air balloon rally launching off in the distance. Mother Nature gave us a second beautiful day, apparently so that the pilots flying an Unknown would have no excuses for mental errors. In the end, the winner was the pilot who flew the Unknown flight without a zero.

Some of the other folks who deserve credit and our thanks for making the contest a success are Assistant Contest Director Ronald Smith and box marker grunts Paul Goyette and Yvan Turcotte.

From our friends in Quebec: Un *gros* merci a tous…a *big* thank-you to everyone.

MONTREAL ACRO CHALLENGE FINAL STANDINGS

SPORTSMAN

Weston Liu	Pitts S-2A	79.91%
Larry Ernewein	Bücker Jungmann	79.59%
Byron Brumbaugh	Decathlon	77.38%
John Wyman	Pitts S-1S	75.45%
Patrick Abriat	Pitts S-1S	69.13%
Neil Bilodeau	Pitts S-2B	23.79%

INTERMEDIATE

Sheldon Apsell	Extra 300L	76.40%
Bill Gordon	Pitts S-2B	71.74%
Doug Lovell	Pitts S-1T	71.37%
Peter Ashwood-Smith	Pitts S-1T	70.32%

Calendar of Events

Saturday, October 7
Contest: Harold Neumann Barnstormer
Region: South Central
Location: New Century AirCenter Airport – locator IXD, Olathe, Kansas
Hosting Chapter: IAC 15
Practice/Registration: Friday, October 6
Rain Date: Sunday, October 8
Categories: Primary and Sportsman Power only
Contest Director: Connie Johnson
Contact Information: 816/453-5047 (home); 816/347-1331 (work); 816/560-6404 (cell); *cjohnson4532@kc.rr.com* (e-mail)

Friday, October 20 – Saturday, October 21
Contest: Borrego AkroFest
Region: Southwest
Location: Borrego Valley Airport – locator L08, Borrego Springs, California
Hosting Chapter: IAC 36
Practice/Registration: Thursday, October 19
Rain Date: Sunday, October 22
Categories: Primary through Sportsman Power
Contest Director: Michael Church
Contact Information: 949/852-8850 (work); *mc@sunriseaviation.com* (e-mail)
Contest Website: *www.iac36.org*

Saturday, October 14 – Sunday, October 15
Contest: Rocky Mountain Invitational
Region: South Central
Location: Lamar Municipal Airport – locator LAA, Lamar, Colorado
Hosting Chapter: IAC 5
Practice Registration: Friday, October 13
Rain Date: Saturday, October 21 – Sunday, October 22
Categories: Primary through Unlimited Power
Contest Director: Jamie Treat
Contact Information: 303/648-0130 (home); 719/721-8149 (work); *JamieTreat@direcway.com* (e-mail)
Contest Website: *http://iac5.org*

Friday, October 27 – Sunday, October 29
Contest: Mason-Dixon Clash
Region: Northeast
Location: Farmville Regional Airport – locator FVX, Farmville, Virginia
Hosting Chapter: IAC 19
Practice/Registration: Friday, October 27
Rain Date: None
Categories: Primary through Unlimited Power
Contest Director: Jim Walker
Contact Information: 919/349-0057, Jwslim1@aol.com

Mishaps Data

Compiled by Bruce Johnson

MISHAPS BY MONTH

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2005	0/0	1/2	2/2	1/1	1/2	2/2	3/4	1/1	1/1	0/0	0/0	0/0
2006	0/0	1/2	1/1	1/0	1/1	1/0	0/0	0/0				

MISHAPS BY YEAR

YEAR	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
MISHAPS	20	26	21	24	20	18	12	9	15	9	10

Numbers depict accidents/fatalities of total accidents in the U.S. by aerobatic aircraft. Accidents included are only those which occurred during aerobatic maneuvering (including air shows) or during an IAC-sanctioned competition.

One of the most useless things in aviation is "Altitude Above You." It is the cheapest insurance one can have.

PRELIMINARY

Accident occurred Wednesday, August 16, 2006, in Mojave, California
Aircraft: Extra Flugzeugbau EA 300, registration: N12DW
Injuries: One serious

This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed.

On August 16, 2006, about 1300 Pacific Daylight Time, an Extra Flugzeugbau GMBH EA 300, N12DW, impacted flat desert terrain about 175 yards northeast of the airport perimeter fence at the Mojave Airport (MHV), Mojave, California. The pilot/owner operated the airplane under the provisions of 14 CFR Part 91 as a personal flight. The airplane was destroyed. The pilot, who was the sole occupant, was seriously injured. Visual meteorological conditions prevailed for the local area aerobatic flight, and no flight plan had been filed. The primary wreckage was at 35 degrees 03.55 minutes north latitude and 118 degrees 09.10 minutes west longitude.

A Federal Aviation Administration (FAA) airworthiness inspector responded to the accident site. He reported that the debris field was elongated, about 100 yards in length. The debris path was along a north/south direction, and the airplane came to rest upright on a magnetic heading of 060 degrees. He indicated that the impact appeared to be at a very high velocity and hard impact, with several divots found along the length of the debris path. He located the first identified point of contact (FIPC) as the tail wheel, as well as multiple "deep" propeller blade strikes in the hard dirt. Both wings separated. A post-impact fire started at the right wing and was put out by responding fire department personnel. The FAA inspector interviewed a helicopter emergency medical services (HEMS) crew who witnessed the accident. The HEMS crew was located at the airport, about 1-1/2 miles away from the accident site. They watched the airplane complete several "tail slide" maneuvers, and then saw it flat spin and hit the ground. They responded to the accident site, assisted with the extrication of the pilot from the airplane, and then transported the pilot to a local area hospital.

The FAA inspector also interviewed a tower controller. The controller reported that he had cleared the pilot for takeoff to work in the aerobatic box and had no further contact with the pilot. The controller further reported that he did not witness the accident.

The National Transportation Safety Board (NTSB) investigator in charge (IIC) interviewed the airport manager. The airport manager reported that prior to the flight he saw the pilot's aerobatic permit, issued by the FAA, to practice for an upcoming airshow. The airport manager watched the airplane take off, turned away for a moment, and when he looked back, he did not see the airplane. According to several witnesses interviewed by the NTSB IIC, it appeared that the pilot was practicing a Cuban 8 maneuver. They also reported that the airplane was doing low-level aerobatics that one group estimated to be about 100 feet above ground level. On the accident maneuver, the airplane did a loop and was at the bottom of the loop in a nose-down angle when it dropped behind an MD-11. The witnesses expected the airplane to reappear as it had done on the previous occasion, but instead saw a cloud of brown dust.

FINAL

Accident occurred Saturday, July 30, 2005 in Denison, Texas
Probable Cause Approval Date: January 31, 2006

On July 30, 2005, approximately 1509 Central Daylight Time, a single-engine experimental/exhibition Zivko Aeronautics Inc. Edge 540-T aerobatic airplane, N95DE, was destroyed upon impact with water while maneuvering near Denison, Texas. The private pilot, sole occupant of the airplane, sustained fatal injuries. The airplane was registered to and operated by the pilot. Visual metrological conditions prevailed and a flight plan was not filed for the 14 Code of Federal Regulations (CFR) Part 91 personal flight. The local flight originated from the Grayson County Airport (GYI), near Denison, Texas, at an unknown time.

According to information obtained by an FAA inspector, who responded to the accident site, a boating event was being conducted on Lake Texoma, near the Eisenhower Marina, and numerous boats and people were in the vicinity of the marina at the time of the accident. The airplane was observed by several witnesses as "performing aerobatic maneuvers at a low altitude." Witnesses reported to the FAA that the pilot had completed a hammerhead stall and was attempting a second stall before the airplane impacted the water in a near-vertical attitude. According to the FAA, the pilot was wearing an emergency parachute, but not a helmet.

Several witnesses provided the NTSB with written statements, including the following:

One witness, who was the pilot of a helicopter, reported that he was orbiting

over the marina at an altitude of about 500 feet above ground level (agl) with two passengers who were photographing the boat event and N95DE. The witness stated that he was in radio contact with the pilot of N95DE during the flight and notified that pilot that he was entering a right turn to orbit the marina. The pilot of N95DE responded that he was "climbing over the water," but did not give an exact position. No further radio transmissions were received from the pilot of N95DE. During the turn, a passenger aboard the helicopter reported observing the airplane in a "flat spin." The pilot of the helicopter leveled the helicopter and observed N95DE at an altitude of about 300 feet agl.

The pilot stated that N95DE stopped spinning and was in a wings-level, nose-down attitude of about 30-45 degrees. N95DE continued "on a westerly heading with a high sink rate into the dock area of the marina at an angle of approximately 30-45 degrees" until it impacted the water. The witness then transmitted a "mayday" call on the local traffic frequency that N95DE had impacted the water.

A second witness, who was located on a boat at the marina, reported that he had observed an "acrobatic stunt plane make several low-altitude, high-speed passes over the marina and arriving speed boats." The witness stated that during the first pass, the airplane was approximately 80-100 feet above the treetops on the shoreline, and during the second pass, the airplane was about 150 feet above the water. A few minutes later, the witness heard the airplane again and observed it flying downward at a "steep angle toward the marina" at an altitude of about 150 feet above the water. The airplane sounded like "the engine was at full throttle." The witness further stated that when the airplane was approximately 50-60 feet above the water, the airplane "appeared to take a steeper angle" before it impacted the water between two boat houses in a "nearly vertical" attitude.

PERSONNEL INFORMATION

The 51-year-old pilot held a private pilot certificate with airplane single-engine land and multiengine land ratings, and an airplane instrument rating. His most recent FAA third-class medical certificate was issued on March 22, 2004, without limitations. At this time, the pilot reported that he had accumulated 2,150 hours of flight time. A review of the pilot's logbooks from 1970 to September 15, 2004, indicated a total flight time of 2,616 hours. The most recent logbooks were not located. Friends of the pilot estimated that he had accumulated between 50 and 100 flight hours in the accident airplane.

AIRCRAFT INFORMATION

The Edge 540-T was an experimental single-engine, mid-wing, tailwheel-equipped, two-place airplane, serial number 2018, that was approved for exhibition aerobatic operations and certified under 14 CFR Part 21.191 in the Experimental category. The inspection records of the completed airplane after it was built indicated that it was found to be in a condition for safe flight on November 8, 2004. A two-hour initial test flight was flown on November 30, 2004, and the test pilot signed in the logbook that the airplane was safe for operations.

The airplane was powered by a modified six-cylinder Textron-Lycoming IO-540 engine from Barrett Performance Aircraft, Inc., in Tulsa, Oklahoma, designated AE IO-540-X, serial number BPA 8682. The propeller was a three-bladed, constant-speed Hartzell HC-C3YR-4AX (serial number A71226B) model that was approved by the manufacturer for full aerobatic flight.

METEOROLOGICAL INFORMATION

At 1505, the automated weather observation system at GYI reported wind from 070 degrees at 9 knots, visibility 10 statute miles, scattered clouds at 6,500 feet, temperature 88 degrees Fahrenheit, dew point 57° F, and an altimeter setting of 30.13 inches of Mercury.

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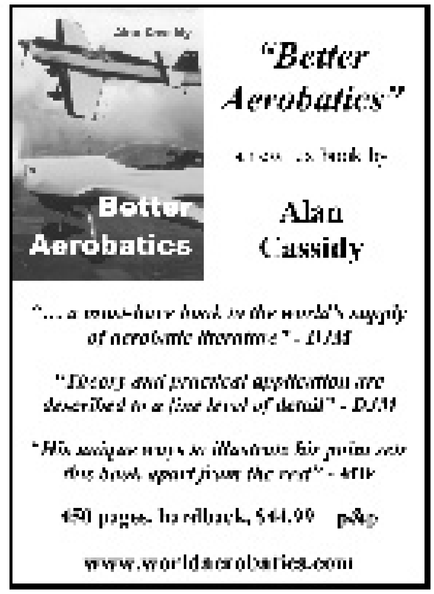

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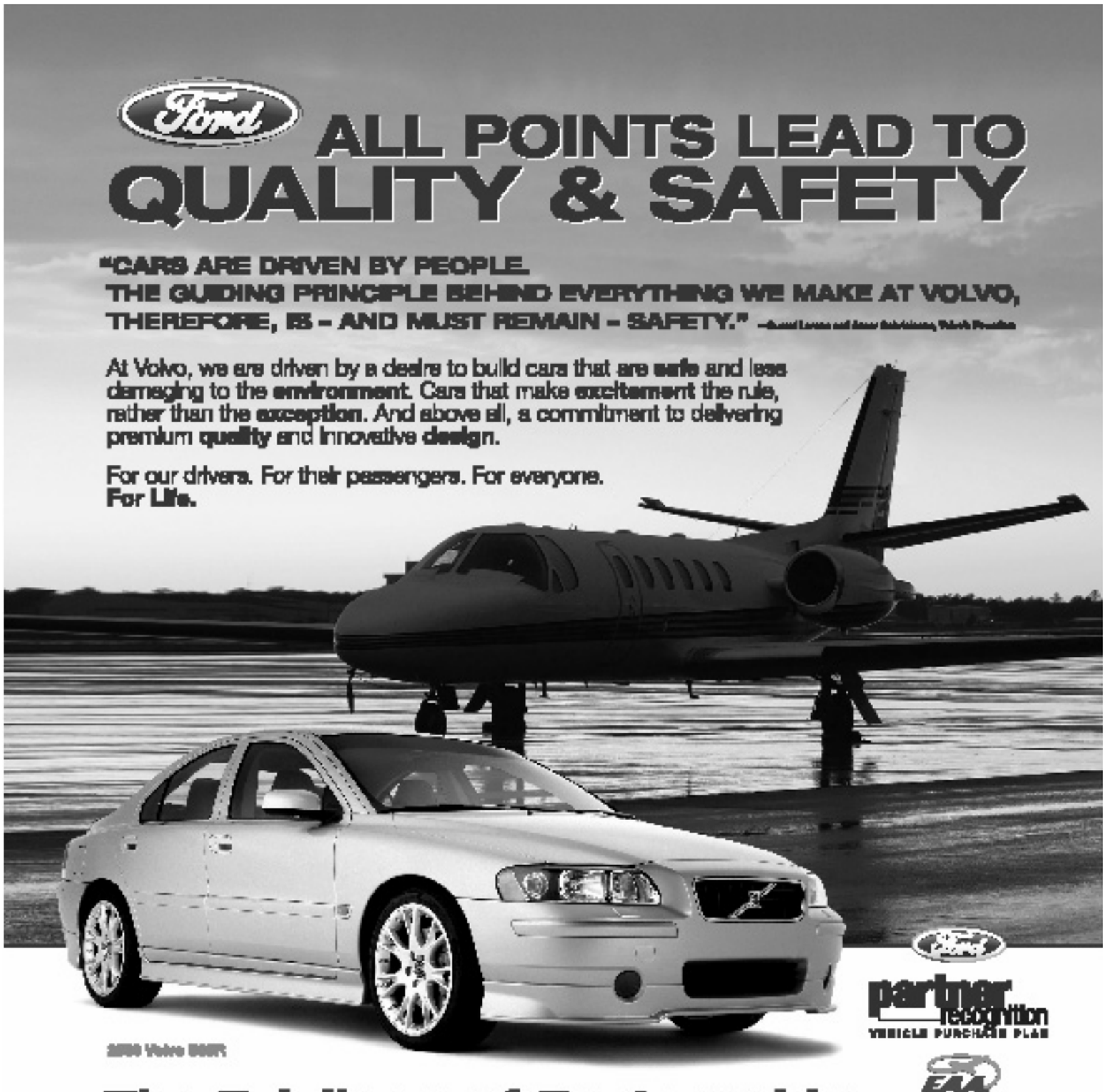

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