

**SPORT**

FEBRUARY 2012

# **Aerobatics**

**OFFICIAL MAGAZINE of the INTERNATIONAL AEROBATIC CLUB**



## **SU-26: Taming the Russian Bear**

**Reflections on the Roll  
Mid-Air Collision**



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*It also has a detachable belly tank; often referred to as the defection tank . . .*

—Julia Wood

## FEATURES

**04** **Taming the Russian Bear**  
*by Julia Wood*

**14** **Some Reflections on the Roll**  
*by John Morrissey*

**22** **Mid-Air Collision**  
*by Kirill Barsukov*

## COLUMNS

**03** / President's Page  
*Doug Bartlett*

**28** / Ask AI  
*Allen Silver*

**32** / Safety Corner  
*Steve Johnson*

## DEPARTMENTS

**02** / Letter From the Editor

**30** / Contest Calendar  
Advertising Index

**31** / FlyMart & Classifieds



## THE COVER

Julia Wood on the deck in her SU-26.

Photo by Lynn Cromer

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

## The More Things Change...

**IF THERE IS ONE** constant in life, change appears to be it. The International Aerobatic Club is now in its 41st year of operation, and it doesn't take too much perusing through old issues to see that change in stark relief.

Since 2008, I've had the pleasure of bringing you 41 issues of *Sport Aerobatics*. There is no way that would have happened without the hard work and perseverance of the people who've submitted content to fill these pages. But there's one person, in particular, I'd like to mention.

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fill these pages.

For nearly four years, I've had the pleasure of working with our art director, Phil Norton. He has been an invisible hand, helping shape the look and feel of *Sport Aerobatics* Magazine in a way that has helped enhance our image to

members, new and old alike. With few exceptions, I've allowed Phil creative license to use his artistic talents to add a distinctly visual element to these pages. I believe it's helped make *Sport Aerobatics* a better magazine.

Recently, there've been some organizational changes within the EAA. One element of those changes is that Phil will no longer be tasked with *Sport Aerobatics*. We'll still be bringing you a wonderful magazine, but I wanted to say a special thank you to Phil for working with me to make *Sport Aerobatics* the magazine it is today. You will be missed.

This month's issue was exciting to put together. John Morrissey puts his decades of aerobatic expertise to good use by explaining the importance of the roll to competition aerobatics. There is much wisdom to be gleaned from his words, and I was honored for his contribution.

Julia Wood tackles what she refers to as "The Russian Bear," her Sukhoi 26. Working together with photographer Lynn Cromer and her husband, Tony, they've put together a fun story about a unique airplane. Look for a follow-up piece from them in an upcoming issue.

Finally, Kirill Barsukov brings us his hair-raising tale of a mid-air collision inside the aerobatic box during practice. His quick thinking and calm demeanor are evident in the story, and I am so glad to be able to bring this story to our members. **IAC**



**DOUG BARTLETT**  
COMMENTARY / PRESIDENT'S PAGE

## Don't Fly Backward!

**HOW IS IT, AS** a competition pilot, that after starting a sequence in the correct direction, we can make an error and fly the balance of the sequence in the wrong direction? Situational awareness is a skill we all learn early on as pilots. We use it in every form of flying we do. When learning to land, situational awareness is important, as we need to know where other aircraft are in the pattern and how it will affect our own pattern. In instrument flying, we need to plan ahead and think about which approach to expect. We need to anticipate what we should see on our instruments even prior to scanning them. So why is it after acquiring these situational awareness skills in other aspects of flying, we are able to fly three, four, or more figures on the wrong axis?

There are few original training thoughts or skills developed by the majority of aerobatic pilots. Most of us learn from watching others. Situational awareness in the aerobatic box is not a skill that can be learned by watching others fly in the box. It has to be learned on the ground. We have all watched competitors do their "acro dance." You know, they spin around on the concrete ramp, tilting their arms up and down as if they were the wings of a winning aircraft. Fun and funny to watch at the same time!

But look closer next time you watch the dance. You may see a pilot practicing a "pattern to the box." Then there is the one who flies with her eyes closed. And another who actually walks backward

through some portions of the maneuvers. What's that all about? Well, the answer to that question is what will prevent you from flying more than two maneuvers in the wrong direction; hopefully, only one: situational awareness.

Let's start with the pilot who does the dance with her eyes closed. Watch how she holds the card in front of her in the same place as it is in the cockpit. The head is moving from front to side, then back

**Situational awareness in the aerobatic box is not a skill that can be learned by watching others fly in the box.**

again. What can she see with her eyes closed? This is the pilot who you thought wasted her practice slot yesterday by flying from one corner of the box to the other doing hammerheads and humpties, first clockwise then counterclockwise. Instead of wasting time doing one more competition sequence, this pilot was acquiring the sight picture needed for situational awareness. When doing her "acro dance," she is in the cockpit recalling what she expects to see in each part of each maneuver: box

markers, judging line, runways, lakes, roads, etc. If an error is made during the actual sequence, it is easy for her to recognize and correct because the sight picture was not what was expected.

Why was she holding the card out in front of her? She was teaching her eyes where to look for the information that was needed at different times during the sequence. Another way to accomplish this task is to get into your cockpit and run through the sequence, visualizing each part of the flight from takeoff to landing. This is also a great place to relax just prior to your flight.

How about that pilot who was walking backward? This pilot was taking the strong winds into consideration knowing that they were going to greatly affect his plane. He knew exactly where he wanted to be in the box at the start of each figure but had to simulate the wind for situational (positioning) awareness.

The purpose of the "acro dance" is not to simulate John Travolta on the dance floor, but to simulate your sequence in the cockpit. With this in mind, teach yourself the skills necessary to do so.

And how about that pilot who was practicing a pattern to the box? That was me. It was a skill taught to me so I would never again enter the box in the wrong direction and fly the entire sequence backward.

Never practice in the air what you have not thought about first on the ground. Fly safely! **IAC**





Finessing a

# RUSSIAN BEAR

Flying the Sukhoi 26, Part 1

BY JULIA WOOD

**I** had just graduated from college and was teaching private, commercial, instrument, and multiengine students and loving it. However, I just couldn't understand the aerobatic flying thing. I wanted to go upside down, do loops, go straight up, go straight down, but in a Cherokee?

# RUSSIAN BEAR



**SO, I DECIDED TO** book lessons with the French Connection in Poughkeepsie, New York, flying CAP 10s. But, before I started, I had a moment of clarity...I was still a flight instructor and not making much. What was I thinking? I decided to hold off and play after I got my career going. Besides, I could use that money to rack up some precious multiengine time instead of flying upside down in a CAP 10. We all must wonder how we ever had enough common sense in our younger days!

Fast-forward 10 years. I'm a DC-10 first officer for a major airline, flying with a captain who has clipped a little card, with scribbles all over it, on his yoke. As he looks at the card, he's motioning his hands all over the cockpit. By the end of the trip, I had learned a lot about aerobatics from Gerry Molitor.

A month later, a scuba diving trip I had planned was canceled. I found myself with a week scheduled off, money saved up, and nothing to do. So, what's a girl to do but get her teeth cleaned? It turns out my dentist is a retired F-4 guy. I told him about wanting to learn aerobatic flying. He said, "Don't you know that Debby Rihn-Harvey has a flight school just down the road in Houston?" I was living in Austin at the time. "Uh, Debby who?" I replied a bit embarrassed. "She's only one of the best aerobatic pilots in the world," he replied. I left his office with her number.

## DISCOVERING AEROBATICS...AND MY HUSBAND

After a week at Debby's place, H&R, I had flown the Decathlon, Pitts S-2A, Pitts S-2B, and Extra 300. A month later, I competed in my first competition in the

Decathlon. Later that year, I proudly flew a gorgeous Immelspin in the Decathlon at my first national competition. And, I became engaged to my instructor at H&R, Tony Wood! All this just from going to the dentist. Go figure!

## THE SUKHOI

Fast-forward again. Tony and I are married, living in Weatherford, Oklahoma, and commuting to Chicago for work. At home, we fly our Pitts S-2B as much as possible. We bought her nine months after we were married, so we refer to her as *Baby B*. I'm happy in our *Baby B*, but Tony needed a little more and said soon I would, too. So, we test-drove the Edge, CAP, Extra, and Sukhoi.

The reason for this article is the Sukhoi, and since I'm writing this, you have to hear my opinion. Here goes. The first thing you notice is that the Sukhoi is a real airplane! The Edge, CAP, Extra—they don't have the same big-airplane feel. Not the Sukhoi. You can walk all over it, yank on the stick, and throw it around the sky. For a Russian bear it's tough, fast, and nimble.

We found a gorgeous blue Sukhoi 26 for sale in Oklahoma City. It was stripped down for its annual inspection when we went to see it. Wow, even naked this is a



real airplane, and it's huge. Actually, I'm lacking in the height department; I'm petite, okay, short. I never fit in anything. But, the Sukhoi comes with three seat sizes. You don't move a lever to adjust the seat; you just put in a new seat. Brilliant! So, out went the medium seat and in went the small seat. I hopped in, positioned the adjustable rudder pedals, and fit perfectly!

Then the mechanic said, "We need to run it up to check the compressions. You wanna crank it up?" "You betcha!" I said, and back out I hopped. Why, you ask? A radial powers the Sukhoi, and you don't just turn the key to start a

radial. First off, those bottom cylinders have a tendency to collect oil, and you have to get rid of it. The Sukhoi has a big three-blade MT prop. Twenty-one blades turned through did the trick, and I hopped back in the cockpit, huffin' and puffin'.

I started looking around the panel, and all the labels were in Cyrillic. Okay, now what do I do? Fortunately, it's a pretty simple system. There are not too many switches, and the guys talked me through it. Six primes, circuit breakers in—which ones? All of them! Canopy closed. I sat there looking around, "Wow! This really is a meaty, tough



I started looking around the panel, and all the labels were in Cyrillic. Okay, now what do I do?

*The Sukhoi's cockpit is military-grade, like the rest of its design.*



*Twenty-one blades before start-up ensures no oil in the bottom cylinders.*

# RUSSIAN BEAR

airplane.” Okay, this is the mag, one on, push this thing down, they said that was the shower of sparks, whoooosh! Gotta love it. That’s the air starter. Big, geared prop, one blade, two blades, okay, push on this button, it’s alive! It’s loud! It’s vibrating! Makes your whole body shudder! The guys outside gave me three fingers—throttle up to 30 percent. How fun is this! They’re motioning me to taxi out. So, out in the drizzle I went with no cowling and no headset. Unlock the tail wheel. Some differential braking needed, no problem, big rudder. Add some power, oh yeah; even during taxi it’s got it! I taxi back to the hangar where the guys meet me and raise six fingers, so I push the throttle up to 60 percent and wait 20 seconds, which they told me later drains out excess fuel and oil in the lines, then flip both mags off, no mixture control, it’s super-charged with a carburetor. How cool is that? I popped open the canopy, big smile on my face, and said, “What’s your best price?”

That was back in 2000, and almost everyone thought we were a little nuts for buying a Sukhoi. They weren’t very prevalent back then, and there wasn’t a lot of reliable and easily obtainable information about them. We primarily learned through trial and error, even seeking professional help from master “bear tamers” on how to finesse this bear.

**“She was rolling;  
then suddenly, it was  
like nitrous and straight  
up she went!”**

When we bought our Sukhoi, we also got a truckload of parts. Two extra engines, an air compressor tank, an alternator, a whole Russian tool set, and a flight bag of manuals, logbooks, aircraft books, engine books...all in Cyrillic!

## BACK TO OKLAHOMA

Tony allowed me to fly the Sukhoi home and followed me in *Baby B*. The previous owners said to add half-throttle during my first takeoff. “It’s a handfull,” they said. So, of course, I followed their advice. It was rockin’, but not what I expected. Over the radio, I heard Tony

say, “All the way!” I liked that idea and pushed the throttle all the way. Skyward I went, and just a little rudder was needed. Tony saw the takeoff from *Baby B*. “She was rolling; then suddenly, it was like nitrous and straight up she went!”

After leveling off, Tony wanted to see a roll. I shoved the stick full right. “Wooohhhooo, where am I?” I rolled all right and even went laterally a couple hundred feet! Tony was cracking up. “Okay, let’s try that again,” he said. And we did, again and again and again.

The next day, I was practicing and had one of many “teaching moments.” I pulled what I thought would be a simple 90-degree turn. I pulled like I would pull on *Baby B*. What I got was a 9g, almost blacked out, coughing my lungs out, kind of turn. “Wow, what just happened?” I gasped. After a few seconds, when I could answer Tony’s fervent radio calls, I said I was okay and was thankful that I pulled off the turn with some semblance of cool.

A note about the seat: It is set at a 45-degree angle that puts the pilot’s knees up into a crouched position, fighter jet style, allowing the body to accept more g’s than when in a vertical position like the Pitts. The aircraft is rated at plus/minus 10g’s. And, with this seating position, the pilot can do it without really noticing. Yeah, right. Our bodies just aren’t designed for that, so we’ve adjusted our seat to a 30-degree angle. Just because we can doesn’t mean we should!

I am often asked which airplane I like better. That’s an apples and oranges type of question. The Sukhoi and Pitts are two different airplanes with two different purposes. But, this article is about the Sukhoi, so let’s stay with that.

The Sukhoi was built for the Russian aerobatic team. In 1984, the Sukhoi Design Bureau, the creators of Russian front-line fighters, designed an airplane with a huge engine and every exotic composite material they could find. The Sukhoi 26 was born. Tony said, “It’s like asking Lockheed to build an aerobatic airplane.” The Sukhoi thrived in Russia, and



*With adjustable rudder pedals and the Sukhoi-designed small seat insert, Julia fits perfectly in her bear.*

by 1990, it was finding its way to the United States.

Ours, however, has an interesting history. It was built in 1989, flew in the national aero club for several years, and then one day didn't return to Russia after an air show and somehow ended up in the United States. In 1995, it was shipped to Aero Country Airport north of

Dallas, Texas, where it was assembled and obtained FAA certification in the experimental-exhibition category.

The original two-blade prop was changed to an MT composite three-blade prop. The original, squeaky Russian brakes were changed to Cleveland wheels and brakes. The altimeter in meters changed to an altimeter in feet, and

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# RUSSIAN BEAR

the airspeed indicator went from kph to mph. We later put the kph airspeed indicator back in so we could coherently converse with other Sukhoi drivers. Our Sukhoi was sold in 1996 to an Oklahoma City partnership that flew it just for fun, but never competitively. This bear was not being allowed to growl!

## PERFORMANCE

The Sukhoi is such an easy airplane to fly. It's long and straight with tons of power. It weighs only 1,500 pounds with a 360-hp engine—great power-to-weight ratio! It has a 16-gallon internal fuel tank that is enough fuel for about 30 minutes at max power. It also has a detachable belly tank; often referred to as the deflection tank, which holds 34 gallons. A long fuselage, big rudder, and big, cambered, clean wings with lots of aileron make for a very stable airplane. Its big rudder makes it easy to control in a crosswind and easy to recover from a spin. Clean, smooth airflow over a composite structure gives it plenty of lift. It's easy to land. Just plop it down on the titanium gear and tap the brakes. It climbs thousands of feet per minute, rolls dizzyingly fast, and sounds great. What more could a person ask for?

About the engine. We fund our flying with no sponsors, so we take great strides to obtain maximum life out of our engines. The Vedenev M14 series radial

engine has been used to power a wide variety of aircraft. They are tough engines designed to be flown hard and stored outside in all climate conditions. The M14P radial engine makes the Sukhoi that much more interesting and demanding. There is no official time between overhauls; however, there is a design life limit of 2,250 hours. When it starts using too much oil, it's time for a new engine. Maintaining oil

**It's easy to land.  
Just plop it down on  
the titanium gear and  
tap the brakes.**

and cylinder temperature is done manually via a unique iris-type cowl flap that actually regulates the airflow entering the cowling instead of controlling the air exiting the cowling. During aerobatics, the iris is contracted, allowing for maximum airflow over the engine to keep it as cool as possible. Our airplane came with a brand new pickled M14 in a crate. It also came with a salvaged M14 off a Yak-52. We used it as a training platform as well as reusing all the usable parts off it as necessary for our engine. Finally, in 2009, it was time to install the new engine. It was perfect, right out of the crate. Varoom!

Here's a comparison between the Russian bear and Pitts. I'd give our Sukhoi to just about any tailwheel guy to fly. I wouldn't do that with our Pitts. I'd recommend our Pitts to just about any tailwheel guy who's looking to get into aerobatics. I wouldn't do that with the Sukhoi. It's too much of a bear. The Sukhoi also takes more preflight time. Here's what I mean. Let's say you've had a busy day, but have an hour to get a flight in before sunset...

Scenario 1: Pull out the Pitts, add some fuel, and check the oil. Do your walk-around, tires good, all the screws in, flying

*Business or pleasure? Julia admits that the Pitts is definitely more of a strap-on-and-go machine. The Sukhoi, not so much.*





PHOTOGRAPHY BY LYNN CROMER

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# RUSSIAN BEAR

wires tight, throw on a chute and helmet, clear, and you're off. Twenty minutes later, you've had a relaxing flight; land, push it in the hangar, close the door, and drive home in time for a dinner at sunset.

Scenario 2: Pull out the Sukhoi. Pull off the bottles from the tail, engine drain and exhaust, and pull off the covers. Pull out of the hangar, add fuel, and add oil—always! Prime six times, wait for the fuel to drain before closing the plug, pull the blades through 21 times, rest a minute, put on a chute and helmet, close canopy, and start it up. Wait for it to warm up; note there's not much time left for the flight, but no worries, it'll just be a shorter flight. It will be an exhilarating one. Enjoy the sunset on short final, land, run it up for 20 seconds, shut it down, and clean up the very large oil pool on the ramp. Push it in the hangar, cover it up, put back on the bottles, close the hangar doors, and drive home exhausted, in the dark, grabbing a sandwich on the way.

You can see the Sukhoi and Pitts are two different birds. Both are wonderful in their own ways. The Sukhoi will require more time before and after each flight than the Pitts. But personally, I enjoy that time. Quite often, someone will see me pulling the prop through and ask to help. Sometimes, I gladly accept depending on how well I know the person, but most of the time I don't. It's a time for me to feel the airplane, learn each blade, listen to it hiss, observe the compression of each cylinder as it goes around, observe how much oil bellows out on each round, and to amp up or

down for the flight itself. Sometimes, it's just my time. But, it is time, and it's not a plane for those who don't have it or who aren't willing to take it. It also requires a person who is mechanically inclined,

**It is easy to forget  
that the propeller is  
turning the other way  
...until you try your  
first hammerhead or  
humpty bump.**

who can think creatively, and who can be patient when special parts are being made or ordered. It's not always possible to call Aircraft Spruce and have things shipped overnight.

Not too long after we acquired the Sukhoi, our Pitts became unexciting for me to fly. It was just not as much fun to fly as



the Sukhoi. So, it sat for a while. But gradually, I came back to her and still fly her competitively. And, even though the Pitts is a small airplane, it's not built for a petite girl. G-forces during pushes, especially push hammers and inverted spins, force me to the back of the seat, and I am able to push the stick with my fingertips only. Hardly makes it easy to fly a precise upline or precisely exit a spin! But, the big ol' bear is really quite a cozy fit for me thanks to the interchangeable seats and movable rudder pedals. My feet reach the pedals perfectly. I have full deflection of the stick—forward, aft, left, right. I stay in the seat with my belts not too uncomfortably tight. It's a perfect fit!

I've already said she's easy to fly. For takeoff, add power and pull back on the stick. Landing, approach at 160 "klicks,"

idle over the end, pull back smoothly, three-point, keep straight with slight rudder movements, unlock the tail wheel, and exit the runway. That's it.

Basic aerobatics in the Sukhoi is an exhilarating nonevent, as strange as that may sound, and very intuitive. It is easy to forget that the propeller is turning the other way—that is, until you try your first hammerhead or humpty bump. Different technique and opposite rudder are definitely required during those maneuvers. The Sukhoi is quite happy rolling left or right with no difference in technique. Spins are straight forward, and loops are simply a matter of deciding what radius you want and pulling or pushing the appropriate amount. The feedback from the Sukhoi is very reminiscent of the Pitts. Changes in sound and little airframe buffets that let

you know you are not quite coordinated or getting close to stalling are very similar to the Pitts. Snap rolls happen very fast and have presented the greatest challenge.

Okay, now, the hard part: precision. Roll rates are extremely fast, and stopping an eight-point roll perfectly every 45 degrees requires practice. That's where hours and hours and hours come in. However, the airplane is very happy to be at high g, and that is very physically demanding, which limits the amount of hours the pilot can endure. Limiting the g-loads to a reasonable level is one of the most important disciplines a new Sukhoi pilot must master. The Sukhoi is so capable it often seems like I can have it mastered one day and then feels like I've never flown it the next.

Next time, I'll discuss flying the Advanced Known in the Sukhoi. **IAC**

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*...I had to dead stick my Pitts in and an old timer said "Nice save. Someone taught you well." Yes they did! Thanks, Budd.* -Craig H.

*My insurance company covered me, a low-time, low-tailwheel-time pilot in a single-hole Pitts largely because I went to Budd for my training.* -Tom P

*... the engine failed at low altitude and the accident investigators said that my fundamentals saved me. Thanks my friend.* -Maynard H.

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Some reflections on . . .

# the Roll

The slow roll is really the key to advanced aerobatics

BY JOHN MORRISSEY

**W**hen aerobatic pilots talk about the roll there is a good possibility that perceptions of the word roll may differ. Definitions have changed since José Luis Aresti defined the slow roll as a 360-degree rotation about the longitudinal axis of less than 15 seconds' duration. He called a roll of more than 15 seconds a super slow roll. So the term slow roll really had nothing to do with the roll rate, rather it just defined its difference from the super slow roll. In today's terminology for powered aerobatics there is no longer a super slow roll. The slow roll is now part of the aileron roll family that is one-third of the trilogy of rotational elements; namely, the aileron roll, the snap (or flick) roll, and the spin. Aileron rolls are further divided into the slow roll (non-hesitation) and hesitation rolls. Snap rolls are subdivided into positive and negative snaps. The subsets of the spin are positive and negative spins. To avoid any cumbersome repetition of terms in this essay about the roll, I will limit my remarks to the aileron roll and its two subsets with the majority of my observations in the horizontal plane. So please consider my use of the term roll as inclusive of both aileron rolls and the older term slow roll. This piece is not intended to be a detailed how-to discourse on the roll itself, but rather some reflections, history, and thoughts about perfecting the key to advanced aerobatics.

## SELF TAUGHT

There were few aerobatic schools or instructors 40 years ago when I purchased a Starduster Too and began the process of self-taught competition aerobatics. I suppose because I had been involved in all-attitude flight for several years while flying fighters I assumed it would be a simple matter to tame this little aerobatic mount and begin a glorious career as a famous aerobatic pilot. Since I could not find any aerobatic instructors, I did the same thing most folks in my situation did; I purchased some books on the subject and began to teach myself.

Well, that didn't pan out too well.

I just could not break the code for the slow roll. I tried for months to follow the "...begin the roll to the left with left rudder and left aileron" tutorial in almost every book I read. This well-intended advice did not work for me. The heading followed the rudder and the nose dropped. I had put this aerobatic training business on the shelf for a few months when I took my Starduster to a local fly-in and met a friendly World War II P-47 driver. We had been talking for a while when I mentioned that I had flown the grandson of his P-47 Thunderbolt, the F-105 Thunderchief. We got along well and had a nice visit about Republic fighters and our wars. He was about to leave when I asked him if he'd like to go for a flight. In no time at all we were level at about 3,000 feet. After flying the Starduster for a while he asked if he could try a roll. "Sure, of course," I said. But what I thought was, "This should be interesting." As it turned out, it was very interesting. He rolled it on a rope—no muss, no fuss, no heading or altitude change. All I could say was, "Do that again, would you?" This time I paid attention and felt the controls. Oh, so he's blocking the left turn with right rudder when the left roll begins...

And so with that part of the mystery solved, I began again to try to understand and perfect the roll. It took me about two years and more than 200 flights of regular practice to make significant progress with the task. Sometime during that process I





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# theRoll



was fortunate enough to find Neil Williams' book *Aerobatics*. I still refer to his work often and find it very helpful for serious students of aerobatics in all categories. That magnificent tome is certainly not scan reading. I am continually amazed, after rereading it many times over the years, to find a pearl or two I had not previously noticed. I did not see them during my first journeys through the book because I was not yet sufficiently aerobatically developed to understand some of the nuances of his message. One of the mistakes I made while learning the roll was attempting to perfect the final product in one step without doing the sequential heavy lifting required to achieve the desired result. One can find many books that detail where the controls should be at the cardinal point in a roll. But what is not readily apparent from reading those how-to pieces is that the number of coordinated rudder and stick movements during a roll are too numerous to describe individually. Those control movements cannot be memorized because there are too many continually changing combinations required during a roll. If one seeks this sort of deft perfection when first learning the roll, frustration will make progress very difficult.

## **BREAK IT DOWN**

Believing there had to be a better way, I came to the conclusion that the roll had to be learned by segments. Once learned, those segments could then be assembled into a complete roll. Only then could one begin developing the real finesse required to perfect the roll. I condensed that thought into an aerobatic teaching principle: "Every maneuver has a procedure as well as

a technique. The procedure must be learned before the technique can be honed." From this evolved the phrase I use when teaching any aerobatic maneuver, especially the roll—GIWIT. This acronym means "give it what it takes." And that means one is to use whatever control it takes in the moment to achieve proper movement about the three axes and do so without worrying about being smooth.

First, get control of the maneuver. Then begin to polish it.

I began with the simplest of rolls. I call this the primary roll, and it's only objective is to give the student confidence in the aircraft, as well as himself. While not a pure aerobatic competition maneuver, it allows the pilot in training to roll the aircraft about the longitudinal axis with no input other than aileron. And this is why what we now call the primary roll used to be called the aileron roll—a roll performed with only the aileron. We increase the pitch of the aircraft to about 20 degrees, release the pitch force on the stick completely, and then add full aileron in the direction of the

roll. When the wings become level after 360 degrees of rotation, the stick is released to stop the roll with the nose being about as far below the horizon as it was above it when the roll began. After a brief pause the nose is then raised to level flight attitude. Done correctly, the aircraft will neither change heading nor lose altitude. No rudder is needed as the angle of attack will approach zero once the pitch force is released. Once that happens, there will be no adverse yaw; therefore, no rudder will be required to control heading.

After this roll is learned, and it does not take long, then the true roll teaching begins. I start this phase by asking the pilot to roll the aircraft 30 degrees left while holding heading with right rudder. Once the heading is controlled during the roll in and out, the pilot will notice that the nose will drop and some altitude will be lost. That is the point where the concept of raising the nose simultaneously with the roll is introduced. This usually brings up the question of a possible downgrade due to a change in pitch during a roll. The answer to this is that only the altitude is required to remain constant, not the attitude. The roll training then progresses to knife-edge flight where the student will notice that continued back-pressure will pull the aircraft off heading. At that point it becomes fairly easy to show that it is back-pressure that is causing the heading error and the beginning of the requirement for forward-pressure to control heading. This is also the phase of training where the student begins to realize that back-pressure can change heading as well as altitude, depending on the bank angle. And because of the way flying is taught in the United States, these concepts are not intuitive because they have never been explained or presented. The pilot must now learn to control the aircraft simultaneously in the three dimensions rather than drive it within the very confined pitch and bank parameters of level flight.

Well, you can see where this is heading. We progress through the roll using the flight controls to produce the desired sight pictures, even if the pilot experiences unfamiliar yaw or uncomfortable g-forces. By now we are beginning to learn how to force the plane to follow a desired flight path rather than allowing the

aircraft to change heading and altitude during the roll. We learn to control the aircraft instead of being controlled by the plane.

### THE EYES HAVE IT

Here it is very important to mention the importance of sight pictures and of distant vision during aerobatic flight. The student must be taught from the beginning that clear and distinct focus to the furthest point ahead of the aircraft's flight path must be maintained. I refer to this as deep focus, a skill that must be developed as it is neither easy nor intuitive. One must train oneself to do this because the usual resting focal distance for our eyes when there is nothing to look at is only about 31 inches. In my previous life, to lose sight

of the bandit's speck on the far horizon meant to lose the fight. I tell pilots in training that I want them to be able to read the stock market pages in the newspaper tacked to a phone poll 20 miles away. When vertical down I want them to pick out blades of grass. This is the beginning of situational awareness in all axes of flight. Having said that I must mention that there is an enemy to the deep focus equation. For some reason I cannot explain, one's focal distance will rapidly decrease when a rotational element begins. This tendency to begin focusing on the cabanes, gas cap, or even the instrument panel must be arrested during the slow roll phase of aerobatic training. Once the concept of deep focus is mastered during and within any rotational element, the pilot will be able to accurately and naturally use sight pictures during maneuvers. An example of this is the relationship between the wing and the horizon during inverted flight and at the 90- and 270-degree positions of a roll, in vertical and 45-degree flight, and during loops. And make no mistake about it; the use of a sighting device will degrade deep focus as well as one's

We learn to control the aircraft instead of being controlled by the plane.



# theRoll

ability to use the entire aircraft and its relationship to the horizon as attitude references. In this visual relationship between the aircraft and the horizon, it is the horizon that must remain in clear and distinct focus, not any part of the aircraft. If pilots were having any difficulty with their rolls during the years I was team trainer, all I asked them to do was to remember their deep focus. Without fail, that small reminder immediately cleared up any problem they were having with their rolls.

## THE ROYAL ROAD

Now let's look at the reason the roll is so important in competition. And let's do so from the mathematical viewpoint. The total K of all aileron roll variants almost always dominates the total K for a single aerobatic element as well as the majority of the K in a sequence. If that is true, then it is obvious that a competitor can never be a contender unless the roll is mastered.

Two examples may help illustrate the point:

In this year's Unlimited Known Compulsory (the Q in CIVA competitions) the total K for all the maneuvers in the sequence is 342. The total K for all aileron roll elements is 102—30 percent of the total K. And the total K for all the maneuvers, seven out of nine, that contain those aileron rolls is 282. That means 82 percent of the total K will be directly affected by the quality of the aileron rolls. As a comparison, 71 percent of the total K will be affected by the quality of the snap roll.

Looking at the Intermediate Known Compulsory sequence from the same viewpoint we see the total K is 185. The total K for all aileron roll variants is 54—29 percent of the total K. But the total K for all the maneuvers, seven out of 12, that contain aileron rolls is 94. This means that 51 percent of the total K for the entire sequence is directly affected by the aileron roll quality, while only 11 percent will be affected by snap roll quality.

Please take a moment and let this truism sink in: The slow roll is really the key to advanced aerobatics.

While this piece is not designed to be a how-to article, I would like to mention a few points I have noticed over the years that may make your transition from the primary roll to the razor sharp and brisk execution of the roll a little easier.

If your initial experience in aerobatics was in one of the modern monoplanes that have roll rates in excess of 400 degrees per second, then this discourse on learning the roll may not seem very relevant as fast roll rates can mask a multitude of errors.

There is so much to learn about the slow roll that you must not try to advance faster than your progress will allow.

However, as you progress to hesitation, multiple, and opposite rolls, you will find that understanding and mastering all the factors involved in the perfect roll will be essential to your success. If you doubt this, just try to fly one of Mr. Aresti's slow rolls of at least 15 seconds' duration without changing roll rate, heading, or altitude. If you have any fundamental errors in your roll, this little exercise will find them, especially in a monoplane.

The number one asset you can have when learning the slow roll, and indeed all the maneuvers, is good aerobatic flight instruction. If I had just received a few lessons in the slow roll, I could have saved two years and a couple of hundred hours reinventing the wheel. Neil Williams also had this same experience many years earlier. He too mentions it took him more than two years to begin to understand the roll.

Try not to get ahead of yourself. The process of learning aerobatics reminds me of Aristotle's admonishment to his instant gratification pupil Alexander the Great.



“There is no royal road to geometry,” he said. And to those I instruct in aerobatics I emphasize that neither is there a royal road to the King of Sports. You must do the practice. As Laurence Gonzales mentioned in his classic *One Zero Charlie*, you must learn to play the high notes before the tune, to master the metronome before the piano. There is so much to learn about the slow roll that you must not try to advance faster than your progress will allow. Remember the old saw: “Paint only dries so fast.” When you begin to have trouble, get some instruction. Don’t get mad; get help. Alternatively, backtrack to the point in the maneuver where you began to have the problem and sort it out from there. Do not try to roll faster than your proficiency will allow. Increase aileron deflection as your control of the roll improves. Too much rudder use at the wrong time is one of the main problems one encounters when learning aerobatics.

However, if one does not know how to use the rudder, aerobatics can never be learned, let alone perfected. In a roll, the rudder is not used to move the nose but rather to hold the nose where you want. Never allow a descent to begin during a roll—keep the nose far enough above the horizon to prevent any loss of altitude. In the beginning phase of your training, allow yourself to gain a little altitude as you learn the roll. Remember, if your nose is 2 degrees too high, you may gain 20 feet. If it is 2 degrees too low, you may end up losing about 200 feet.

The most common error I have seen when teaching or coaching the roll over the past 40 years is the pilot’s failure to add forward-pressure as the aircraft transits the inverted position. When that occurs in a left roll the nose will begin to drop and come toward the pilot as it passes through the inverted position. In this example the nose of the aircraft will be low and off heading to the right at the 270-degree knife-edge point with the pilot pressing hard on the left rudder to make the poor plane finish on the original heading with a severe left yaw. In a perfect roll the heading will never change and there will be no yaw/sideslip at the end. If it takes excessive left rudder during the last 90 degrees of a left-hand roll, you can be certain that not



enough forward stick and right rudder was used from the inverted portion of the roll until the three-quarter roll position.

Any time a rolling segment is begun from inverted on a level or 45-degree line, the first control movement is forward stick pressure, then aileron. Rudder does not roll the plane. That is the aileron’s job.

If you want to know if your roll quality is progressing properly, try performing four points of a two-point roll on a level line with no cloud, road, or section line for reference. If you can maintain a constant heading and altitude during that roll, then you are well on your way to mastering the roll. For trainers, give the exercise to your students. If the heading in a left roll migrates to the right during the roll, one can be certain that a deep focus has not been established and that, sorry to be repetitious here, not

enough forward-pressure is maintained on the stick at and after the inverted position is reached. And remember, as you add forward stick going through the inverted position of a left-hand roll, right rudder pressure will have to increase to hold your heading due to increased adverse yaw. If you are letting the nose drop at or after the inverted point in a roll, two things may be operative. You may not know the proper sight picture for level inverted flight, or more likely you know the sight picture but have lost your deep focus to the far horizon.

#### **KEEP ROLLING**

It is very important to practice the roll on every flight to develop and maintain your muscle memory. Developing this muscle memory is critical to your ability to fly competitive sequences. “Metronome” muscle memory exercises will develop your ability to perform



# theRoll

ascending flight. The purpose of this type of training is to verify the muscle memory needed to spend 90 percent of your time during an aerobatic sequence concentrating on energy management and presentation. Like a chess game, you must clearly see how the sequence is developing in the moment as well as the proper path to your final maneuver. This is only possible if your hands and feet are reacting to your thoughts and performing the required maneuvers automatically while you are focused on managing the game. If you find yourself thinking about performing individual maneuvers during a sequence, then you are not quite ready for a winning competition flight.

Spend very little time looking inside the cockpit—very little.

One of the most powerful statements made by Neil Williams in his seminal work is: “There are so many parameters to be considered in such a short time it is small wonder most pilots never really master the slow roll.”

At the end of the day, it is not so much how you manage to perfect the technical aspects of the roll. The only operative requirement is that you must be able to create the illusion of perfection when you perform the roll. During the 1996 FAI World Aerobatic Championships at Page Field in Oklahoma I watched carefully as the Russians flew their compulsory sequences. After Viktor Chmal flew I felt very confident he would be World Aerobatic Champion. His rolls were lightning fast, on a wire, with rock hard steady finishes that never bobbed.

A true champion’s trademark! **IAC**

**EPILOGUE:** The Starduster won the Sportsman National Aerobatic Champion’s title in 1976 and ’77. Some quotes and ideas are from Neil Williams’ book *Aerobatics*, AirLife Publications, Shrewsbury, England, 1975. Note: Out of publication at this time. *One Zero Charlie* by Laurence Gonzales. Simon & Schuster, New York, New York, 1992.

**John Morrissey** has operated Great Planes Aerobatics since 1978.

competitive maneuvers while your attention is fully engaged with the sequence. At this advanced stage you must be able to use full aileron during rolls when appropriate. The start to the roll must create the illusion that it has achieved maximum roll rate in the first 2 or 3 degrees of roll. The rate of roll must be the same throughout, and that includes hesitation rolls. The pauses of any hesitation roll must not be rushed but rather match the time it takes to roll to that point. The eight-point roll is the exception as a brief pause may not look like a stop to the judge. If that is the illusion the judge sees, your mark for the roll will be a zero. There is another exception during the eight-point roll—no full aileron here. The pauses during the eight-point roll should be as long as in the two-point roll. The stop to the roll, or any segment of a hesitation roll, must be brisk, hard, accurate, and without bobble.

Try this exercise on your way to and from the practice area: full roll left; full roll right; full two-point roll left and right. Same with the four- and eight-point rolls. Then one-quarter roll left, three-quarter roll right to inverted, full roll left to inverted, and either a right four of eight or two of four roll to upright. If you are having difficulty with any of these rolls, get some help before continuing the exercises as proper muscle memory will be damaged if the rolls are done incorrectly. And correcting faulty muscle memory can take much longer than learning it.

As your confidence and proficiency increase, you can test you muscle memory by closing your eyes and executing a full roll. Open your eyes when finished. The result should be very close to perfect. Then you will know you are ready to start practicing sequences or segments thereof. I always use this method when conducting training camps early in the season to check the muscle memory of our more advanced pilots in various basic maneuvers. In addition to the roll, I also use this method with level and vertical snaps, “blind” pulls to the vertical, as well as one-half and three-quarter aileron and snap rolls in vertical



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**I**'ll bet very few of us aerobatic pilots ever think that we will have a mid-air collision, and I'll bet even fewer of us think that we could survive such a situation. We usually think of the typical types of emergencies: engine failures, wake turbulence, loss of control, or accelerated/unrecoverable spins. We then come up with the escape procedures; we rehearse them, and even memorize them. But how many of us ever think of what we are going to do in case of a structural failure or a mid-air collision? My guess is, probably not many of us. If asked, a pilot's most common answer would be, "We fly too low to bail out anyway. If something happens that low, there is nothing that could be done; it's just bad luck, and we have to accept it."

**WELL, HERE IS MY** story, and I hope it will be useful to you—no matter how slim you think the chances are that something like this will ever happen to you while flying aerobatics at low altitudes.

I was lucky enough to book several aerobatic camp slots with Sergei Boriak in 2011. I fly a Yak-55 in the Advanced category, and the last couple of camps that I attended were very productive. One of the sessions was scheduled on August 20 and 21, 2011, at the Hammonton Municipal Airport (N81), in Hammonton, New Jersey. This summer wasn't very generous in terms of good weather, and I was pleasantly surprised when I saw bright sun and blue skies on that Saturday morning. So after I had arrived and unloaded the plane, I signed the waiver, got my sequence card ready, rehearsed the flight, and went back to the Yak.

#### IMPACT

It didn't take me long to climb into the cockpit and get strapped in. In a matter of minutes, the M-14 engine came to life with the familiar cloud of smoke under the belly of the plane. Engine warm-up, taxi, and takeoff were uneventful. A few minutes later I was on the base leg of the aerobatic box, diving into the start of my sequence. I was working my way through the maneuvers from the 2011 Advanced Known. Figure 6 is a push to a hammerhead with 4 of 8 on the downline. I have had trouble with the inverted entry before, so I concentrated on making sure that my controls were neutral before the entry and there was no bank or yaw. I established a more or less clean vertical, waited for the right moment to execute the pivot, and kicked the right rudder when the time was right. The nose of the Yak followed the rudder while I was working the ailerons and the elevator to make sure that the pivot was in the same plane and that I had not torqued. With full power on the Yak, I established the vertical down and started to get ready for the 4 of 8, when I heard a tremendously loud bang and the whole airplane shuddered.



The engine noise subsided significantly, and I started to hear the whooshing sound of the air. Things felt more natural now. I have around 350 sky-dives under my belt, and the old instincts must have kicked in. I quickly stabilized my body position and established flat, belly-to-the-ground attitude. My feet were pointing to where the plane must have been. I tried to look back to see how far I was from the plane and tried to determine if it's safe to pull the rip cord. I was able to see several pieces of debris falling down, but I could not recognize my plane. I thought to myself that the Yak must have suffered some sort of a structural failure and actually disintegrated. As I didn't see anything big falling in my vicinity, I figured that I was safe to pull the chute. Based on the way trees looked, I figured I was still at around 1,000–1,500 feet AGL.

#### UNDER CANOPY

I looked at the chute handle, locked my hands on the ring with my thumbs going through the ring, and pulled the rip cord directly away from me. This is what they teach you at the sky-diving schools. There was not much resistance, and as soon as the ring and the cable left the housing, I tossed them away. I wasn't very confident that everything was okay with the parachute as I did not feel any resistance when I pulled the rip cord. In hindsight, I think that was because my high level of adrenaline, and the force I applied when pulling the rip cord, did not leave me a chance to feel anything. I looked behind my shoulder to make sure that the opening sequence had kicked off. To my pleasant surprise, I saw the pilot chute leaving the container and being pulled away with the airstream. A split second later, the main

canopy left the container and opened. It opened fast, and the force of the opening jerked me down in the harness and whipped my head backward. I looked up and saw a round canopy over my head made out of white and orange segments. One of the segments on the back of it was made out of mesh material to provide the canopy with some sort of forward motion.

Being satisfied with the fact that the chute has opened and that I was still quite high enough in the air, I looked down trying to get myself oriented. I knew I shouldn't be further than a half a mile away from the runway, and I wanted to get my bearings before I hit the ground. At this point I realized that the round canopy does not provide any noticeable forward penetration, and I was at the mercy of the wind. I also realized that I was not going to



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harness was just a little too big for me, or if I didn't have the harness adjusted correctly to start with. One way or another, next time I will make sure the chute fits me tightly. Allen Silver will analyze the problem with my parachute in part two of this article.

When I examined my helmet, I saw that the visor was gone, the cable leading to the mike piece was ripped out, and there were some large scratches on the front part of the helmet. By the looks of it, I think if not for the helmet, I could have been knocked out or worse. The helmet definitely helped me to stay conscious throughout the accident and prevented some likely serious head injuries. The helmet probably saved my life.

Thinking back about what happened, and talking to people who witnessed the accident, it took me about four to five seconds to get out of the tumbling-forward section of the Yak. The Yak was sliced in half by the ring wing of a Lancair IV, about 18 inches behind my head. That also explains why I had trouble sliding the canopy back. The canopy rails must have been bent as a result of the impact. It took another three to four seconds between the time I got out of the cockpit to when the chute opened. We estimate that the collision took place around 2,800-3,000 feet AGL, and that I was able to open the parachute at around 1,200 feet.

There are many articles about pilots hesitating for too long before deciding to bail out of the airplane and being out of altitude and options as a result. The interesting thing was that as soon as I made the decision to bail out, I did not have the slightest hesitation about it. I think a big part of the decision to bail out was my prior sky-diving

experience, which I was lucky enough to have before this accident. After making several hundred sport jumps, I did not have any mental blocks about leaving an airplane, especially an airplane that had something seriously wrong with it. I would recommend, to everyone who wears a parachute when flying, to go to the nearest drop zone and make several jumps to feel what it is like to get out of an airplane and come back to the ground under a parachute. This could save you the valuable seconds that you may spend hesitating before leaving the plane. It will also help you survive after you leave the cockpit and find yourself in the clean air falling down to the ground.

Please, write down your bailout procedures and rehearse them! I completely missed the item of shutting down the engine before leaving the cockpit. Yes, I was very lucky not to get hit by the propeller of the tumbling-forward section of my plane. It could have turned out very differently, if I had been less fortunate.

Unfortunately, there is a tragic side to this story. The pilot of the Lancair, David Mitchell, 71, of Voorhees, New Jersey, was killed in this accident. First and foremost, every time I think back to the events of that day, I feel a deep sadness and sorrow knowing that someone died in the accident that I was lucky enough to survive. My thoughts and deepest condolences go to David Mitchell and his family. There is nothing that could be said or done to undo this loss.

In Part II of this article, we will analyze what led up to this accident, review the NTSB report, and describe several actions you can take to prevent this from happening to you, including making sure your parachute fits correctly! **IAC**

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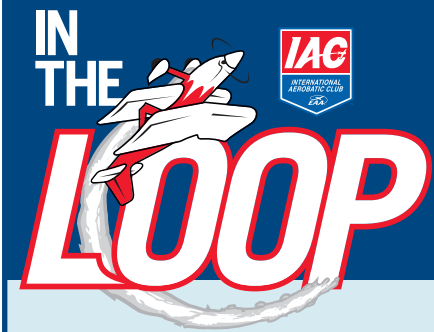
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## The Year in Review

**FIRST LET ME WISH** everyone a happy new year. On a more sobering note, I need to reflect back on flying this past year.

Most of you do not see the full gamut of the flying industry as I do. You take your airplane out of the hangar every week or so, go upside down a few times, and then put it away for the week. Your adrenaline rush has been satisfied.

But, I pretty much see the entire picture. I've been involved in the air show industry in some form or fashion and as a sky diver for more than 50 years. For three or four of those years I performed as a wing-walker, and I still announce an occasional air show. I also hold a private pilot certificate with an instrument rating. I feel I have a pretty good understanding of the industry. Most of you are aware that I service parachutes from all facets of the aviation world. My customers include air show performers, glider pilots, competition pilots, and recreational pilots of all types. This past year has not been kind to pilots and for some who were just spectating. This past year I lost friends. Some close and some just good customers. For those of you keeping count, 2011 was not a good year. Even one accident is one too many.

I'm one of only about 40 designated parachute rigger examiners for the FAA. I sometimes get involved personally with the aftermaths of such accidents when they involve a parachute. I often wonder if there is more I can do to help. Am I doing enough to prevent such tragedies? I try my best to make sure my customers and those I give safety seminars to don't become one of those statistics that are written and talked about. We have all heard someone say, "I hope we can learn from this tragedy." Unfortunately many people read about an accident and think, "This could never happen to me." You need to wake up and smell the coffee.

Most, if not all, of last year's accidents involved people who had an enormous amount of experience compared to most of us. I'm not here to explain what went wrong, but I can assure you that taking a few steps prior to each flight will help reduce the risks of you becoming a statistic. Most of you don't have to be told to fasten your seat belt when you get into a car or airplane, and everyone should know by now smoking is bad for you. You also know that an improper preflight inspection can be quite costly.

It's never too late to make New Year's resolutions. Some resolutions like going to the gym seven days a week and lose 25 unwanted pounds are probably not realistic for the vast majority of us. But attending an FAA Safety Team (FAAST) program or a local presentation is. How about this resolution: Don't be afraid to ask for support and advice from your flying mentors, and don't be afraid to step up to the plate to give support and suggestions to your friends and fellow pilots, even if they're more experienced than you. Peer pressure can be intimidating. Sometimes, even if the batting count is three balls and two strikes, you have to take a swing at the plate and speak out. Especially if you see something that you think is dangerous or life-threatening. The day you stop learning is the day you need to hang it up. Taking a couple of hours out of your life now to learn something new or to reinforce what you already know may someday save your life.

Remember, it's never too late to teach an old dog a new trick. Just a couple of months ago I was a giving a customer an

oral and practical parachute rigger exam, and he showed me how to do something a little easier. Why hadn't I thought of that before? Keeping an open mind can be rewarding. My resolution is to keep out of the doughnut shop at least six days of the week. If I can train my car not to drive by the doughnut shop, I'll have it made.

I'm writing this column from the December 2011 ICAS (International Council of Air Shows) convention in Las Vegas. This is the world's largest gathering of air show performers and possibly egos. But those egos have a lot of experience, and I always leave with something new and important learned. I was having a conversation with a doctor after we had left one of the many seminars, and I'm going to quote a couple of things he said. Where he got the quotes from he can't remember, but I would like to share them with you. "The oldest pilots know when not to fly." What a simple statement, but how true.

As we were exchanging information, we got on the subject of how we make decisions. He'd attended a convention of

doctors, and one presenter had a question for his audience. What percentage of your decision-making is based on emotion and how much on fact? He asked his audience to write down their answers. Most came up with a higher percentage based on fact than emotion. When he unveiled his chart he said that research done by doctors of psychology came to the conclusion that almost 90 percent of our decision-making was based on emotion and only 10 percent on fact. That's something to think about. If that's a true statement, then each of us needs to step back, slow down, and rethink some of those decisions that could possibly lead to disastrous results.

I've given you enough to think about for now. Remember to let your emotions run wild and actually make the bold decision to e-mail or call me with that question you have on your mind. Operators are standing by Monday through Thursday from 9 a.m. to 5 p.m. (PST) at [allen@silverparachutes.com](mailto:allen@silverparachutes.com) or 510-785-7070.

Blue skies! **IAC**



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## CONTEST CALENDAR

Mark your calendars for these upcoming events.

Updates at [www.IAC.org](http://www.IAC.org).

### Revenge of the Aerobatist (Southwest)

Saturday, March 17 – Saturday, March 17, 2012  
 Location: Redlands Municipal (REI):  
 Redlands, California  
 Tel: 619-417-0839 • E-Mail: [Casey@allwaysair.com](mailto:Casey@allwaysair.com)

### Ben Lowell Aerial Confrontation (South Central)

Saturday, May 26 – Sunday, May 27, 2012  
 Location: Sterling Municipal Airport (STK):  
 Sterling, Colorado  
 Tel: 303-514-1609 • E-Mail: [mlformeyr@msn.com](mailto:mlformeyr@msn.com)  
 Website: <http://www.iac12.org/>

### Ohio Open (Mid-America)

Thursday, June 14 – Saturday, June 16, 2012  
 Location: Union County airport (MRT): Marysville, Ohio  
 Tel: 574-721-4340 • E-Mail: [jgranger@columbus.rr.com](mailto:jgranger@columbus.rr.com)  
 Website: [www.iac34.com/](http://www.iac34.com/)

### Midwest Aerobatic Championship (South Central)

Friday, June 22 – Sunday, June 24, 2012  
 Location: Seward Municipal (SWT):  
 Seward, Nebraska  
 Tel: 402-613-5422 • E-Mail: [davidmoll66@gmail.com](mailto:davidmoll66@gmail.com)

### Apple Cup (Northwest)

Friday, June 22 – Saturday, June 23, 2012  
 Location: Ephrata (EPH): Ephrata, Washington  
 Tel: 425-442-8280 • E-Mail: [volez@earthlink.net](mailto:volez@earthlink.net)  
 Website: [www.iac67.org](http://www.iac67.org)

### U.S./Canada Aerobatic Challenge (Northeast)

Saturday, June 23 – Sunday, June 24, 2012  
 Location: Olean Airport (KOLE): Olean, New York  
 Tel: 716-361-7888 • E-Mail: [cbpbmb@aol.com](mailto:cbpbmb@aol.com)  
 Website: [IAC 126](http://www.IAC126)

### Beaver State Regional (Northwest)

Friday, August 24 – Saturday, August 25, 2012  
 Location: Eastern Oregon Regional Airport (PDT):  
 Pendleton, Oregon  
 Tel: 2063997097 • E-Mail: [johnsmutny@gmail.com](mailto:johnsmutny@gmail.com)  
 Website: <http://iac77.eaachapter.org/>

### Ace's High Aerobatic Contest (South Central)

Saturday, September 8 – Sunday, September 9, 2012  
 Location: Newton City Airport (KEWK): Newton, Kansas  
 Tel: 316-648-5057 • E-Mail: [ahfefel@cox.net](mailto:ahfefel@cox.net)  
 Website: <http://www.iac19.webs.com/>



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COLUMNS / SAFETY CORNER

## 2011 Accident Summary

**BASED ON 2011 DATA** from the NTSB, 12 aviation accidents were related to flying aerobatics. Three of these occurred during aerobatic practice sessions; four occurred during aerobatic flight at air shows; three involved flying aerobatics in non-aerobatic aircraft; and there was one mid-air collision during aerobatic practice in a monitored box and one crash during an ICAS waiver renewal flight.

Two of the accidents were caused by structural failures of the aircraft: A Staudacher lost an aileron during an air show flight, and a Skybolt lost wing fabric and ribs during aerobatic practice. The Staudacher pilot was able to land successfully, and the Skybolt pilot bailed out and was uninjured. The other three air show accidents were impacts with the ground during aerobatic flight, causing fatalities.

Three of the accidents occurred in traditionally non-aerobatic aircraft: a Piper J-3 Cub, Luscombe 8A, and American Aviation AA-1A. All three of these accidents were from impacts with the ground during aerobatic flight.

Of the 12 total accidents in 2011, nine of the accidents caused fatalities, of which there were 11. There were passengers in two of the accident aircraft, both of which were non-aerobatic aircraft. As pilots, we have a responsibility for any passengers we take flying with us. If we fly aerobatics, we have the same responsibility for our passengers, and we must take the extra steps necessary to protect those passengers while flying aerobatics. Flying higher and staying legal would have prevented the passenger, and pilot, fatalities in these cases. Even in aerobatic aircraft, remember that without waived airspace, our aerobatic floor is 1,500 feet above the ground. Passengers will still get the same wild

ride they want, and the pilot's skills would be better demonstrated by bringing the passengers back after a fun and safe flight.

The structural failures discussed earlier both occurred to aerobatic airplanes: one, an Unlimited class monoplane, and the other a traditional aerobatic biplane. Both of these types of aircraft are typically thought of as "unbreakable" in aerobatic flight, yet we had two examples just in this last year. Inspect your airplanes carefully, before and after flying. If something changes in the feel or flight characteristics of your airplane, find the issue and correct it. There are no "normal" different sounds or feels to our airplanes. If something changes, it needs to be corrected.

It is wintertime, even here in the South, so now is the time to perform the preventive maintenance needed on all of our airplanes. Open up all the inspection panels; look at the aileron bell cranks and pushrods. Rod ends are high-stress components, so inspect them well and lubricate as needed. Make sure all of the rod ends have large surface washers (or are otherwise restrained) to hold them in case the rod end fails. Get a good light and view down the inside of the tail; take a close look at the engine when the cowl is removed. Look for chafing of wires or cables. Our engines move a lot on the mounts when flying aerobatics, so cables and wires need to have extra room to move without binding or chafing.

If you find mechanical issues during your inspections, please post the issues and your corrections on TechWatch at [www.AllAirplanesBreak.com](http://www.AllAirplanesBreak.com). We can all learn from each other, so please tell your fellow aerobatic pilots about mechanical problems and solutions.

Now is the time to get those pesky issues fixed so we can all fly safely in the spring! **IAC**



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