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THE INTERNATIONAL AEROBATIC CLUB'S Aerobatics

JANUARY 2006



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patty wagstaff

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On the Cover: 2006 IAC Hall of Fame inductee Patty Wagstaff

Photo by Dennis Beila



Calendar of Events

2006 Calendar

Saturday, March 18, 2006

Reno Stead Mini Fest

Region: Southwest Region

Location: Reno Stead Airport - locator 4SD, Reno, NV

Hosting Chapter: IAC 118

Practice/Registration: Friday, March 17, 2006

Rain Date: Saturday, March 25, 2006

Categories: Primary through Intermediate Power

Contest Director: Tim Brill

Contact Information: 775/329-3366 (home); 775/232-4881 (cell); tim@aerobaticcompany.com (e-mail)

Contest Website: www.aerobaticcompany.com

Friday, June 9 - Saturday, June 10, 2006

Lone Star Aerobatic Championship

Region: Southwest Region

Location: Grayson County Airport - locator GYI, Denison, TX

Hosting Chapter: IAC 24

Practice/Registration: Thursday, June 8, 2006

Rain Date: Sunday, June 11, 2006

Categories: Primary through Unlimited Power

Contest Director: Barbara Boyle

Contact Information: 972/306-5851 (home); 972/342-4761 (cell); barb.boyle@verizon.net (e-mail)

Contest Website: www.iac24.org

Saturday, June 24 - Sunday, June 25, 2006

Ohio Aerobatic Open

Location: Union County Airport - locator KMRT, Marysville, OH

Hosting Chapter: IAC 34

Practice/Registration: Thursday, June 22 - Friday, June 23, 2006

Rain Date: None

Categories: Primary through Unlimited Power

Contest Director: Gordon Penner

Contact Information: 513/791-7331 (home); 513/520-6065 (cell); gpenner@cinci.rr.com (e-mail)

Contest Website: www.iac34.com

2006 National Championships

Sunday, September 24-Friday, September 29, 2006

2006 U.S. National Aerobatic Championships

Location: Grayson County Airport - locator GYI, Denison, TX

Hosting Chapter: IAC National

Practice/Registration: Saturday, September 23, 2006

Rain Date: None

Categories: Primary through Unlimited Power; Sportsman through Unlimited Glider

Contest Director: TBD

Contest Website: Not yet available

2006 World Championships

Thursday, August 3 - Sunday, August 13,

2006 Advanced World Aerobatic Championships

Location: Radom, Poland

To support the U.S. Advanced Aerobatic Team's participation in AWAC, make a donation at <http://advancedaerobaticteam.com/htmlfile/donations.php>

2006 Judges Schools

Introduction to Aerobatic Judging

February 4-5, 2006

Instructor: Greg Dungan

Chapter: 24

Location: Frontier of Flight Museum, Dallas-Love Field (KDAL), Dallas, Texas

Contact: Bud Judy, 817/559-4522, judydranch@alltel.net

Introduction to Aerobatic Judging

February 11-12, 2006

Instructor: Brian Howard

Chapter: 36

Location: Sunrise Aviation (www.sunriseaviation.com) at Orange County/John Wayne Airport (KSNA), Santa Ana, California

Contact: Jim Peeples, 951/205-6767, jpeeples@aerosurf.net

Introduction to Aerobatic Judging

February 18-19, 2006

Instructor: Greg Dungan

Chapter: 1

Location: Schaumburg Regional Airport (06C), Schaumburg, Illinois

Contact: Jim Klick, 815/609-7165 or 815/258-0047, jimklick@sbcglobal.net

Introduction to Aerobatic Judging

March 4-5, 2006

Instructor: Mike Jones

Chapter: 15

Location: Executive Beechcraft at Kansas City Downtown Airport (KMKC), Kansas City, Missouri

Contact: Connie Johnson, 816/453-5047 or 816/560-6404, cjohnson4532@kc.rr.com

Introduction to Aerobatic Judging

March 04-05, 2006

Instructor: Liza Weaver

Chapter: 288

Location: Embry-Riddle Aeronautical University - Daytona Beach (KADB), Daytona Beach, Florida

Contact: Erica Anderson, 386/235-5744, redpittsdriver@aol.com

Introduction to Aerobatic Judging

March 18-19, 2006

Instructor: Greg Dungan

Chapter: 34

Location: AmeriHost Inn and Union Co. Airport (KMRT), Marysville, Ohio

Contact: Lorrie Penner, 531/791-7331 or 513/284-5076, smuth2@yahoo.com

Introduction to Aerobatic Judging

April 15-16, 2006

Instructor: Greg Dungan

Chapter: 3

Location: EAA Chapter 690 Hangar, Gwinnett County Airport (KLZU), Lawrenceville, Georgia

Contact: Steve Haslap, 770/931-1631 or 404/829-6171, shaslap@bellsouth.net

SPORT Aerobatics



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Publisher: Vicki Cruse

Executive Director: Lisa Papp

Editor: Ken Ibold

Art Director: Rod Karmenzind

Associate Art Director: Kelly Nelson

Contributing Authors:

Vicki Cruse

Rob Dorsey

Kathy Hirtz

DJ Moily

IAC Correspondence

International Aerobatic Club

P.O. Box 3086

Oshkosh, WI 54903-3086

TEL: 920/426-6574; FAX: 920/426-6560

E-mail: editorial@iac.org

Display Advertising

Director, Advertising: Katrina Bradshaw

Phone 920/426-6836

e-mail: kbradshaw@eaa.org

Representatives

Northeast: Allen Murray

Phone 609/265-1666, FAX 609/265-1661

e-mail: allenmurray@mindspring.com

Southeast: Chester Baumgartner

Phone 727/573-0586, FAX 727/556-0177

e-mail: cbaum111@mindspring.com

Central: Todd Reese

Phone 800/444-9932, FAX 816/741-6458

e-mail: todd@spc-mag.com

Mountain & Pacific: Keith Knowlton & Associates

Phone 770/516-2743, FAX 770/516-9743

e-mail: kknowlton@eaa.org

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TEL: 800/843-3612; FAX: 920/426-6761

E-mail: membership@eaa.org

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Editor-in-Chief

Scott M. Spangler

Managing Editor

Kathleen Wiltman

Copy Editor

Colleen Walsh

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President's Page

by VICKI CRUSE IAC 22968

E-mail: vcruise@earthlink.net



Happy New Year—and Help Wanted

Resolving to give a little back, the easy way

JANUARY IS THE MONTH filled with resolutions, from promising yourself to practice more, to not changing your oil in one of your better shirts, to Vicky Benzing's favorite of avoiding food poisoning at a contest when you're five points out of 3rd place going into the unknown. One of those resolutions could be to help the IAC—and not necessarily monetarily (although donating to the Advanced Team is certainly a welcome one).

I'm not asking for much. Yet. Just nominations, chairing a committee, a little bit of writing, and drawing unknowns.

NON-FLYING AWARDS: Most competitors know two types of awards are presented at the U.S. Nationals, flying and non-flying. The flying awards are obvious, but the non-flying awards do not seem to be on most people's radar. In this issue and two subsequent issues, you'll find an advertisement for these awards, telling you what they are, the qualifications for nominees, and how to nominate someone. The awards are voted on by the IAC Board. If you know someone deserving of one or more of these awards, please fill out a nomination petition and have your Chapter do the same. Nominations and support from more than one person goes a long way toward winning the award.

SAFETY COMMITTEE CHAIRMAN: After holding the position for 10 years, Bruce Johnson has stepped down. Bruce has been compiling the accident data for the magazine and provided valuable information to the NTSB when needed. If you would like to see this feature of the magazine continue, we need someone to fill this position. Many thanks to Bruce for his years of service. For more information on this position, please contact Bruce Johnson at bjohnsonf16@directway.com.

REGIONAL SERIES SUPPORT: The Regional Series will be in full swing again this year. The Series and special trophies were designed to encourage people to participate in more than one contest in their region. Due to low participation last year, it has been an opportunity for people who normally don't get contest trophies to take home a trophy in each region in which they fly, with some people significantly adding to their trophy collections. For those winning a trophy in 2005, please have a picture taken with your trophy for an upcoming article featuring the winners, even you guys who have won several.

This will be the last year for this program if participation doesn't improve. We'll do our best to publicize the program and the winners, but we need your help by participating.

DATABASE MANAGER: This opening will likely be available in the fall of 2006. The FAA is considering placing aerobatic boxes on Sectional charts and would like the IAC's help in locating them all through the FSDOs across the country. The FAA will issue the waiver, send the location information to the IAC, which will maintain it and pass it along to the charting group within the FAA.

If we ever had a hope of promoting safety by placing aerobatic boxes on charts, this is the time. We need someone

to administer this database. It will be a large task in the beginning to locate all of the existing boxes, from then on it will be upkeep when boxes are renewed, denied, or opened. If you would be interested in this position, please contact me.

WRITERS: *Sport Aerobatics* is always on the lookout for articles, news bits, calendar items, technical tips, etc. Our magazine is our showpiece, and we need good material to fill it. We need serious help in this department. When asked to write something, most people claim they can't write. Sorry, poor excuse. This is why we have an editor. Ken's job is to take your efforts and make them sound like Tom Clancy wrote it, minus the nuclear warheads.

CALENDAR ITEMS: I've asked the Chapter presidents to please send in all calendar items. We'd like to have a Chapter events section in the calendar to include your meetings, fly-ins, critique sessions, and camps. The biggest challenge for you will be getting it to Ken in time. We need at least a two-month lead-time to make it into the magazine; otherwise, it goes on the web.

UNKNOWN: For those competition pilots enjoying the off-season, please take some time to draw up a few unknowns. There are about 40 competitions each year and each category, with the exception of Sportsman, needs unknowns. You can use Alan Cassidy's Aresti software or just draw them by hand. You must include the catalog numbers and make sure you meet the criteria addressed in the Red Book (see pages 5.5-5.6).

Those of you who hate all the pushes in Advanced or the outside snaps on positive lines in Unlimited, here is your chance to draw up unknowns that you like. Stop complaining and start drawing; we need your help. Without the addition of new unknowns, old ones will be chosen from the library. Unknowns and questions about them should be directed to Brian Howard (BK@NewAttAero.com).

FEEDBACK: Lastly, I'd appreciate your feedback, both good and bad. I jokingly tell people, if it's good news send it to me; if it's bad news contact your Regional Director. One of the ways we can make the IAC better is for everyone to get to know each other.

One of the problems the board is trying to address right now is member information. With the exception of competition pilots, we don't know who you are, why you joined, why you stay and why you leave.

For a business, this is a killer. How can you produce a product when you don't know who your customers are? Impossible! This is what we are currently facing and must fix if we expect this organization to grow. Over the next few months, you may be receiving a survey or a phone call asking you such questions. Please be honest and tell us what you like and what you don't.

Thanks for listening and especially for your help. May you all have a great 2006! ✈

FAA Updates Air Show Policy

EAA and the FAA met several times over the past year to discuss an updated list of air show policies, and when the final rules came out, the FAA implemented nearly all of EAA's recommendations.

Among the specific EAA recommendations accepted by the FAA were:

- Allowing certain formation flights to enter the airspace from different directions when flying above 1,000 feet AGL. Many warbird air shows use these formation flights at stacked altitudes during their events.
- Allowing working media photographers and videographers past the air show crowd line under controlled procedures so they may capture images of aerial demonstrations not available to the public.
- Use of readily recognizable landmarks as corner markers for air show and aerobatic airspace boxes when more practical and identifiable.

When making its recommendations, EAA drew on its more than 50 years of fly-in and air show experience, and its close working relationships with performers and groups such as ICAS (International Council of Air Shows).

"FAA, EAA, and the air show community will work as partners to always make safety the top priority," said EAA VP of Government Relations Earl Lawrence. "When issues do arise, the expertise of EAA and the air show community are valuable resources for FAA to create practical solutions that keep air shows the exciting and memorable entertainment they have become."



EAA argued for allowing certain formation flights to enter airspace from different directions, such as in EAA's ever-popular large warbird extravaganzas at EAA AirVenture Oshkosh.

Cindy Luft

EAA Housing Crunch Gets a Little Tighter

It's that time of year again; time to secure your housing for the World's Greatest Aviation Celebration, EAA AirVenture Oshkosh 2006, which takes place less than seven months from now—July 24-30.

While reservation policies can vary from hotel to hotel, most local lodging is generally booked solid from year to year. But the loss of two sizable hotel facilities over the past few years has made hotel space in Oshkosh that much tighter.

A good place to start is the Oshkosh Convention and Visitors Bureau (OCVB). Call the EAA Housing Hotline at 920/235-3007 or visit the website at www.oshkoshcvb.org/eaacfm. Other than the Oshkosh hotels, options include dormitories at the University of Wisconsin-Oshkosh; hotels, motels, and bed-and-breakfasts in other communities; or private residences in Oshkosh, which open for booking through the OCVB on March 1.

The always-available option is to set up residence at EAA's Camp Scholler, where there's always room for EAA members.

Additional information for EAA AirVenture Oshkosh accommodations:

• Oshkosh hotels: Fully booked, although there are cancellations, which occur the week of the convention. OCVB makes continuous checks with all Oshkosh hotels throughout the week.

• UW-Oshkosh dorms: Some current availability. To check out the status, call 920/424-3226.

• Hotels, motels, and bed-and-breakfasts outside Oshkosh: The OCVB website continuously updates listings, including private area campgrounds, for facilities from 10 to 100 miles away from convention grounds.

• Private housing: Starting March 1, call the EAA Housing Hotline at 920/235-3007 between 8:30 a.m. and 4 p.m., Central time, to check on availability of private housing (ranging from a bedroom to an entire house) located within 10 miles of convention grounds.

• Camp Scholler: For EAA members only, there is a three-night minimum and no preregistrations are accepted (first come, first served). Camp Scholler opens June 23.

For more information, visit www.airventure.org/2006/planning/where_to_stay.html.



Those who opt to camp at EAA AirVenture will always have a place to stay.

Jim Koopnick

TELL US YOUR STORY

Sport Aerobatics is soliciting tales from IAC members describing their experiences in training, competition, and routine aerobatic flying. They can be funny, scary, thoughtful, or just plain impressive. E-mail your submission to kibold@eaa.org or fax it to 904/223-0078.



Stick & Rudder

by Rob Dorsey
IAC 389

Through the Sequence: Sportsman

2006 Sportsman Known is safe, fun, and very nice

Sometimes “reap what you sow” is not such a bad deal. In this case the new Sportsman Known is very nice. Oh, you can always criticize based on your personal preferences, but this sequence is pretty darn good. It’s flyable by lower-powered, non-inverted legacy aerobatic aircraft and is safe and fun—if you follow the rules. Dive in.

For the past year or so a continuously active committee has existed behind the scenes at IAC, which was originally founded to study a complete restructuring of the categories to fit the modern aerobatic fleet mix. When the controversy surrounding the increasing difficulty of the Sportsman Known sequences became more than just a low rumble, the IAC board asked that committee to take a look at the lower category sequences with an eye toward flyability by the legacy fleet.

“Legacy” in this context means the lower-powered and vintage aerobatic favorites of yesteryear, Clipped Cubs, Citabrias, vintage biplanes, etc., many of which are in the hands of members who might like to try competition but are daunted by the difficulty of the sequences previously presented. It

was a good call by the board since committee members, led by IAC Secretary Scott Poehlmann, were selected for their experience in diverse aircraft and their dedication to maintaining an acceptable

I’m utterly convinced there is not even an itsy-bitsy, teeny-weenie desire on their part to exploit their performance advantage.

entry level for new and grassroots competitors.

The problem developed because today aerobatics finds itself, at least in competition flying, with an almost bipolar fleet composition. No, not in the manic/depressive sense, but in a performance disparity sense. As high-end iron has become even hotter and the still-hot last generation world-beaters have become more

affordable, the performance gap between the old stuff and the new stuff has widened into a yawning gulf.

Sitting on the flightline during a Sportsman flight there might be an 85-hp clip-wing Cub flying right after an Extra 300L. This performance inequality plays havoc with the judging and sequence design, and each owner group has its vociferous exponents who pound desks and flood in-boxes demanding that their own needs and wants be addressed. Naturally—and I am sure it is done strictly in a spirit of sportsmanship—the hot machine pilots want a bit of challenge in the Sportsman sequence, and that usually involves at least some vertical performance.

I’m utterly convinced there is not even an itsy-bitsy, teeny-weenie desire on their part to exploit their performance advantage. It is just human nature for

the pilot to whom a nice four-point roll is just a couple of wrist flicks away to not want to share the pain of someone who must get quite physical in order to coax a lower-performance aircraft through that same maneuver.

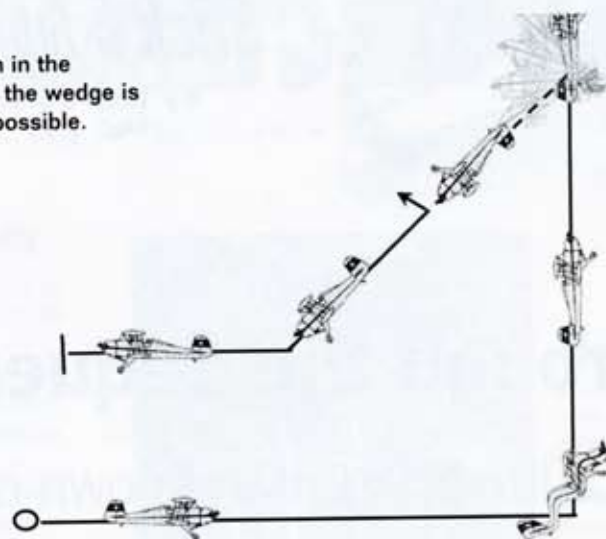
The result of this friendly tug-of-war was to gradually make the Sportsman category Known sequence more difficult, referred to as "category creep," which continued until a large enough group of grassroots competitors cried foul. The IAC board decided to take action, and the Category Committee was called in to supply opinions and options for 2006. Since the committee has within its membership such luminaries as Giles Henderson, from them a unified voice spoke loudly and clearly. "Make the Sportsman Known flyable—and winnable—by a lower-powered, legacy aerobatic type. Make style and accuracy the challenge rather than brute performance." The grassroots community wanted a sequence that *included* aerobatic aircraft rather than *excluded* them.

So, here it is, authored almost completely by Henderson, and we are most fortunate because no one is more qualified to do so. It has board approval, and just about everybody who has seen it or flown it likes it. Is the sequence perfect? No, but given the constraints of the rules and available figures, I'm not sure "perfect" is ours for the having. We might improve on this one, but I doubt that we will in any substantive way.

STARTING THE SEQUENCE

Analyze the sequence as a whole and you will immediately be struck by the fact that this is an especially wind-dependant sequence. If the wind is blowing—and when isn't it?—extra care needs to enter your thinking before you even strap on the airplane.

As drawn in the diagram, the wedge is quite impossible.



Proper analysis requires that you consider our analogy of a billiard game. In billiards you want to leave the ball in an advantageous "lie" after each shot, setting you up for the next. This strategic approach is every bit as important as the ability to sink balls, and so it is here.

It does you no good to be able to fly a perfect figure if the result leaves you completely out of position for the next one, and this sequence demands that same strategic thinking be put to use throughout. If there is a wind blowing down the box, you must try to position your airplane at the up-wind end of the box after each of the three "turnaround" figures, because you have three downwind lines to fly, two of which have rolls in them. Therefore, if wind is a factor—and it invariably is with lower-powered machines—then you constantly need to work toward that upwind end of the box.

I'm not a fan of "wedges" for grassroots aircraft, and figures 1 and 4 are just that. The saving grace for Figure 1 is that it is first, and we can dive to our heart's content to start it. The problem is not really created by the implicit performance required to fly the figure—it does look like it has a definite vertical component—but

that the more inexperienced pilots will try to fly it as drawn.

The IAC rulebook is clear that there is no such thing as a square corner. Any so-called square maneuvers, such as the square loop, are not flown as truly square and are, in today's parlance, "hesitation loops" intended to retain their squarish shape by virtue of the flatness of the sides created by the hesitation and establishment of a momentary line at each 90 degrees.

This figure is no different, and the vertical line is drawn with a square corner before and a sharp 135-degree peak after, merely as an accommodation to tradition and the Aresti/CIVA catalog. The figure must be flown as a pull to vertical, using a normal looping entry, a hesitation in the vertical—it can be so brief, in fact, that the motion of moving the stick to neutral and back again is enough—and then a looping segment across the top 135-degree segment to establish the 45-degree inverted downline.

Truth is, this thing is just an everyday half-Cuban with a little hesitation on the upline. This is completely flyable by a 65-hp clip-wing Cub from 110 mph, but it requires finesse. It also requires a leap of faith—faith in the judges that the Sportsman pilot in a 360-

hp Staudacher executing the same maneuver with an eight-second, 2,000-foot upline gets the same score. If a judging or perception "bonus" is given to the high-performance aircraft because the maneuver comes off as showier, this entire initiative will be lost. To make it fair, the strict criteria of the rulebook must be applied. If that happens, the field is level.

THE NEXT STEPS

Figure 2 is an Immelman started downwind, not a bad deal as deals go. It will make the lower performance aircraft look even lower in performance if any wind is blowing down the box; however, when they get to the top of the half-loop and appear to stop as they roll out, there will be little temptation on the judge's part to call a line before the roll.

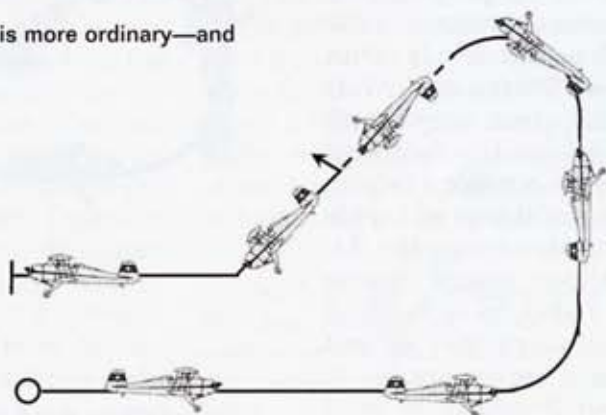
We've seen a number of sequences in the past few years

where a spin follows an Immelman, and the rules on handling the duo haven't changed. As soon as you roll out of the Immelman and get the airplane in hand, close the throttle—or at least get it pulled well back. It makes you look good if you can place the spin right where you want it, and here is the opportunity because

you will exit the Immelman just above stall. If you waited a bit too long going downwind before the Immelman (and why would you?), then here you may "float" the airplane into the wind, well upwind of the middle of the box, before spinning.

Figure 4 is yet another wedge and, much like its sibling before,

In practice, the wedge is more ordinary—and more graceful.



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is nothing but an altered reverse half-Cuban in disguise. The exact same rules still apply in that each corner is a loop segment, not a true corner. Avoid the temptation to make the top pull-down of 135 degrees very sharp. If you are driving something slow, you might be able to make that Cub or Citabria appear to virtually pivot in place to the vertical down with little or no discernable radius (see illustration). While that effect might seem cool—and in fact kind of is—a judge who's on top of things will grade you down since the maneuver criteria require a radius on each corner (although they do not have to be equal). If our hypothetical wind is blowing, it will only succeed in erasing any radius if you are too

slow so save a little speed for the pull-down and keep the guys in the white lawn chairs happy.

As you exit the reverse-Cuban/wedgie thing, you will be pulling through a quarter loop to level flight at high speed, we hope, and also right at the upwind end

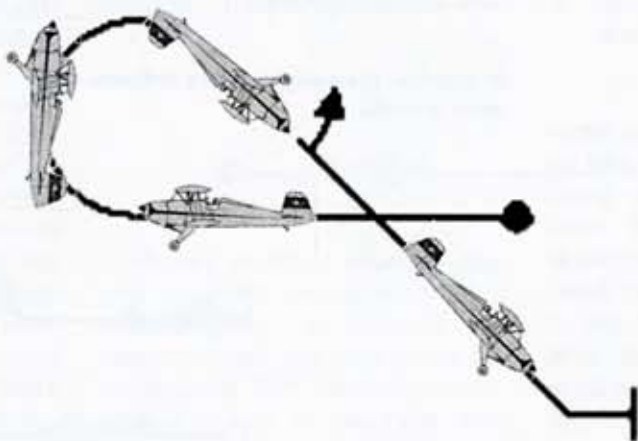
and you have to do a roll and then a half-Cuban-eight. Given our concern about the wind and positioning you need to get this simple slow roll completed no later than just past the mid-box position. This is because we are

right downlines, allowing only enough to gain looping airspeed. The loop is an easy one, done into the wind and therefore can be executed at your minimum looping speed if need be for altitude concerns.

Don't know what I mean by "minimum looping speed"? Well, shame on you. In practice sessions you should have established the minimum speeds for your repertoire of maneuvers just in case you need to enter one slower than usual. If you haven't, go out and, with plenty of altitude, try loops, hammerheads, Immelmans, and rolls at progressively slower speeds until it just won't work. The speed right before when it just won't work is the

minimum speed for the maneuver. Remember them or write them down and tape them to the panel.

Coming out of the loop you want to get a good look over the side to put the hammerhead right at the upwind end of the box. In



The half-Cuban works as drawn.

looking six figures ahead, and to make it all work the hammerhead at the end of the box must be right at the upwind end. This will all come clear to you as we work our way through the rest of the sequence, but just take my word for it here and get into the half-



In the roll, draw the line with the flight path, not the fuselage.

of the box, we also hope. I don't want to rush you here, but time and airspeed are a'wasin'. You are heading downwind with probably the highest airspeed of the flight,

Cuban no later than the last third of the box.

Use the half-Cuban to control your altitude. If you are running low, shorten the inverted and up-

fact, it is very satisfying to rotate around to the vertical downline at the top of the hammer and be looking at the upturned faces of the end or corner judges. Fly

the vertical line right down the upwind box limit and pull out smartly, not hard but without delay—and leave that throttle open because you will need the speed. As soon as the level line is established, you can begin the two-point roll.

Giles Henderson feels that a two-point roll is more appropriate for the legacy and vintage aircraft than the four-point because you need inverted power to make the third point work. Since we are thinking about non-inverted aircraft here, the two-point is much easier to score well on. And, remember the cardinal rule of point rolls: The time spent in the point should equal the time it takes to roll to the point. Therefore, in a slow-rolling airplane such as a Stearman, Zlin, or Citabria, be prepared to spend an appropriate amount of time inverted and

don't rush it.

My personal observations from 37 years of aerobatic competitions are that you can spot the newbie by two benchmarks: closing the throttle on any downward maneuver (hammerhead, back side of the loop, etc.) and rushing point rolls. Just because you may be the new guy doesn't mean you have to look like it.

Out of the two-point roll you should be just past mid-box. The judges will be on one side or the other, most probably to your left, and you want to make the final turn right at them. So if they are on your left, you will turn right, and if on the right, left. Do it with some style, snap the stick over, hold the nose on point, and then suck it around the 270-degree turn at the steepest bank you can handle and pin it heading right at them. Make it look cocky and

confident. Remember, to win, it's their opinion that matters.

With this sequence, the grassroots community, legacy aerobatic aircraft pilots, and those who fly vintage airplanes have pretty much been handed what we asked for. It is flyable, with the little issues discussed above, and should be within the performance and altitude capabilities of any airplane that can safely fly Sportsman.

We got what we asked for; now it's up to us to go out there and make it work. Personally, I'd love to see a real legacy or vintage airplane win the Sportsman national championship in 2006. The thing is there to do, it only takes doing.✈

This is the last installment of Stick & Rudder. We thank Rob Dorsey for his contributions to Sport Aerobatics over the years and wish him the best in the future.



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Nominations are currently being sought for these awards for contributions made in 2005. The awards will be presented at the 2006 U.S. Nationals. More information and nomination forms may be found at www.iac.org/trophies/non-flying_awards.html.

For more information contact Loren Smith at ls@iac78.org





Patty Wagstaff brings home another in a long list of honors

Patty Wagstaff flies one of the most thrilling, low-level aerobatic routines in the world. Flying before millions of spectators each year, her breathtaking performances give a front-row view of the precision and complexity of modern, hard-core air show aerobatics. Wagstaff's first flying lesson was in a Cessna 185 floatplane, and since then she has earned her commercial, instrument, seaplane, and commercial helicopter ratings. She is a flight and instrument instructor and is rated and qualified to fly many airplanes including World War II warbirds and jets.

A six-time member of the U.S. Aerobatic Team, and the highest-placing American with gold, silver, and bronze metals, as well as a three-time U.S. National Aerobatic Champion, an IAC Champion, and six-time recipient of the "First Lady of Aerobatics" Betty Skelton Award, her Extra 260 went on display in the Smithsonian National Air and Space Museum in Washington D.C. in 1994. Wagstaff has won many awards for her flying and is particularly proud of receiving the air show industry's most prestigious award, the Sword of Excellence, as well as the "Bill Barber Award for Showmanship" and is the 1996 recipient of the Charlie Hillard Award.

During the off-season Wagstaff engages in such diverse projects as stunt flying for the movie and television industry, and is a member of the Screen Actors Guild, the Motion Picture Pilots Association, and the United Stuntwomen's Association. She has demoed airplanes for companies such as Raytheon, and has recently been in Africa working with the Kenya Wildlife Service giving re-currency and bush training to their pilots.



CREW



CUSTOM ATOR

STEVE WOLF TURNS UP THE HEAT WITH A FOCUS ON HIGH PERFORMANCE

By Kathy Hirtz

Steve Wolf is the ultimate airplane nerd. He was born with a certain affinity for airplanes, which has grown and matured with him over the years. Many people know Steve Wolf for one thing or another, but few realize all that Steve Wolf is or has done. Those who have attended any one of the major air shows in recent years have seen one of Steve's airplane designs. ¶ He is best known for building Delmar's Gee Bee racer or Jim Wright's Hughes H-1 Racer's beautiful wood skinned wing. Other achievements include the Wolfpitts Samson Bobby Younkin flew in both a solo routine and the Masters of Disaster, the high-g custom wings used by Sean D. Tucker on the Oracle Challenger, the Oreck Cyclone flown by Frank Ryder, the highly modified S-1 Wolfpitts custom airplane built for Norm Willis, and Sean Worthington's S1-11B, to name a few.

Those who have been around for a while also remember Steve as an air show pilot. His flying career began early, and he officially soloed in 10 different types of airplanes on his 16th birthday. He got commercial and flight instructor certificates at age 18, the same tender age at which he began his air show career, flying a ground-level dead-stick routine in an Aeronca Champ with the likes of air show greats Art Scholl and Bob Hoover.

He started his routine with an engine-off spin to stop the prop, and then proceeded with his precision routine of aerobatic maneuvers that ended with a snap roll at 200 feet on

final. Steve's routine was so daring no one has copied it.

Steve built a Pitts S-1 when he was in his early 20s, but before he could perform with it he was recruited by King Hussein of Jordan to develop and coach a national aerobatic team. Steve spent two years in Jordan, recruiting a team and instructing in the Pitts S-2A. His task was to instruct advanced and formation aerobatics to pilots who had no experience in aerobatic flight. He developed the Jordanian Falcons, a successful Pitts formation team, prior to returning to the States. >

< The new Wolf Samson II.



Upon Steve's return he started the Northern Knights aerobatic air show team with Steve Soper, and then went on to get his airframe and powerplant certificate. The two flew a dual aerobatic routine in matching Pitts S-1S and performed across the United States and Canada. Steve then built his incredible Pitts Samson to be his new air show plane.

He performed in air shows across the country in the big noisy Pitts, spewing lots of smoke along the way. Steve went on to get an instrument rating and was one of the first members of ICAS, the International Council of Air Shows, which soon became the governing body of aerobatic performers. After nine years he tired of the relentless touring and training schedule and decided to spend more time with his other love: aircraft building.

Steve was honored when his friend and mentor, the great Curtis Pitts, asked him to demonstrate the newly developed Super Stinker model S1-11 Pitts at Sun 'n Fun in Lakeland, Florida. Steve also flew an occasional show in the Wolfpitts and the new Pitts Model 12 built by Kevin Kimball.

BEGINNINGS

Steve came from a humble beginning. His mother first noted his interest in airplanes at 3 years of age—53 years ago. He was not interested in school. He told his high school counselor that he wanted to be a professional air show pilot. He was told that wasn't a real career, and that he should set his sights on being an airline pilot instead. He wanted to prove that counselor wrong.

Growing up, all he ever wanted to do was be at the airport. Steve did go to a community college to get his A&P certificate, but most of his skills are innate and his knowledge has been learned through hard work and a keen interest in the beauty of flight. Steve's ability to feel how an airplane flies and intellectually know why it does and what it does makes him one of the few air show pilots who truly understands why the airplane can or can't do particular maneuvers. He may have learned this through his childhood years of building, flying, and rebuilding his model airplanes.

Steve's knack for design and performance is best illustrated by his latest wing development: the Wolf Pro Series. In 2004, air show great Sean D. Tucker, who put close to 3,000 hours of high-g aerobatics on his last set of Wolf wings, called Steve and told him he wanted wings that would enable him to roll faster, hover better, and perform in the alpha mode. After some thought, Steve sent Sean some drawings and the project was on.

Sean performed his new routine in 2005 with the new wings and, well, the results speak for themselves. Steve has decided to call the wings the Wolf Pro Series because they are very specialized, providing the edge professional air show pilots want. The fact that Steve does not have an engineering degree makes it even more impressive that he is able to successfully design something like this.

Sean wanted to have his own people cover and paint the wings, and when the naked wings arrived Sean marveled at how beautiful the woodwork was. He called Steve and told him that even if they didn't work he would still be happy because they were so beautifully made he would just take the fabric off and hang them on the wall as a work of art.

The test flight, however, so impressed Sean that he called and said they were the greatest wings he has ever flown. He was able to do everything he wanted to do with them and more, and he was just getting started. He said the wings gave the airplane so much control Steve should consider getting them certificated so they could be put on the Pitts S-2B, which is commonly used for instruction. The wings have a unique appearance, swept back with rounded tips and eight—yes, eight—ailerons.

I met Steve in 2001, just after I had bought a Zlin 242L, a Czech aerobatic trainer. I needed an instructor and read in Patty Wagstaff's book about Steve Wolf and how he helped her. I contacted Patty and she informed me Steve lived in my area. After several phone calls we finally connected and discussed my training.

I'll never forget our first flight.



Steve with the Pitts S1-11, showing the custom wing fairing he created.

Steve had never flown a Zlin 242L, so first he wanted to see if it was a suitable trainer. We soared around the clouds doing the smoothest rolls and loops I could have imagined. I have never seen anyone fly with such confidence and smooth command of the plane before or since; it was impressive. I took 150 hours of instruction with Steve in my Zlin and later in my Pitts S-2B.

What I loved about flying with Steve is the confidence he exudes and the confidence he allows you to develop. I came to love unusual attitudes because I knew he could get us out anything I could get us into, even if I couldn't. The encouragement he gives makes you feel that he is loving every second of his time in the sky with you.

Learning to land the Pitts was not difficult with his guidance. He has more than 5,000 hours in Pitts, and is as comfortable with last-second saves as he is up high doing aerobatics.

Recently, I wanted to work on engine-out landings and realized my fear of landing on a road. Steve agreed to help me address it. First we went out in the Zlin, which was scary enough even though it has good visibility. Steve helped me convince myself that I could fit a 29-foot wingspan on a 25-foot-wide road as I did a low pass at 3 feet. It was a different story when we went out in the Pitts.

I came down to about 20 feet,

straightened out, lost all sight of the road, and freaked out. My fear was immediately back again, and I was convinced I could never land a Pitts on a road. I asked Steve to show me how he would approach it. He took us down, holding it in a slip as we slowed, and came down until about 1 foot off. He then straightened it out, and we touched down. It was so nice, not scary at all.

He then explained his technique by saying he used to land crop dusters on the road and various other planes for one reason or another. Well, that helps explain it.

ART IN PROGRESS

Watching Steve build an airplane has been a new and interesting experience for me. Not being a builder, I, like most pilots, had no idea of all the work that goes into such a project. Steve's shop builds custom one-off aircraft, which means everything is built from scratch except the engine and propeller. It takes hours to design and build each little metal guide or bracket.

The wings are incredibly beautiful

to see prior to being covered. Each rib is beautifully made from individual pieces of wood nailed, stapled, and glued together. They are sanded and varnished and look like a fine work of art, not a structure that will be hidden from view. The fabric is then put on—ironed, doped, and stitched to the perfect tension—and then primed and painted with such care that it is hard to believe this is just an airplane. The fuselage is formed from the tubing, cut and welded. All the little guides and brackets are cut, formed, and welded from sheets of aluminum, as is the cowl and metal sides. Everything fits together with precision so it will hold up for years. Steve uses hundreds of nut plates on each airplane so pieces can be removed and replaced easily, time after time over the years. Seeing all the time and effort that goes into one of his planes makes you wonder how you could bear to take a chance and fly it, let alone bounce a landing.

Steve's latest challenge has been to put bungee gear on his new Wolf Samson II, which was designed to

have rigid gear attached above the lower wing. The problem here is that you have to put fairings between the wing roots and the gear legs—and the parts will be moving. Once again, Steve has come through, employing piano-hinged fairings that look beautiful and can move when they need to. All these things the pilot doesn't think about and maybe doesn't even notice.

Another example is the canopy. Most pilots don't think about how it works or what goes into it; they just open it to get in and close it before taking off. Steve is building the new Samson to have remarkable flexibility. It will have a double canopy that opens sideways, an open cockpit with front windshields for each seat, covered front cockpit and open back, and covered front and bubble back canopy that slides back. Steve spends days not sleeping well as he solves problems like these, and each time he comes up with a practical, beautiful design.

Steve is an expert with the English wheel, a tool used to make curved shapes from metal. His fair-



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ings are masterpieces that are one-of-a-kind, such as those on Sean Worthington's S1-11. Initially the plane was known to have some problems with tail buffet. Steve thought that it was caused by the landing gear attachment angle, so he created a beautiful wing root fairing and the problem was fixed.

After all of the fabrication is done, it's time for one of Steve's greatest pleasures: painting. Paints have changed with government regulations over the years, and Steve always has to adapt to the newest paint styles. Frustrating for many painters, but he pulls it off time and again.

He is an expert with masking and laying out the design. He can take one piece of tape and lay out a perfect curve every time. He says this comes from his childhood, when his mother would limit how much tape he was allowed to use on his models. First he paints the wing with dope so the paint will adhere



Steve built the wings for the Hughes H-1 Racer.

better, followed by hand sanding. He then paints the primer and hand sands for a second time. Then he lays out the design, masks off areas not to be painted with this color, and sprays the paint.

Depending upon the paint, color, and weather, he puts on two to five coats. All have to be perfect or the piece has to be sanded and painted again. If all went well on that coat,

it's on to the next color, repeating all the steps above.

Sometimes a person's skills all come together in a single piece. For Steve, that piece would be Jim Wright's Hughes H-1 replica. Steve built the wing just like the original, as a one-piece, plywood-skinned wing. Steve reflects that this was his greatest work ever. Inside was the beautiful woodwork that Steve is known for, along with metal ducts and retractable landing gear housing. All of the components were created, formed, and welded by Steve. The wing was then covered with plywood sheets that were so expertly fitted everyone thought it was fiberglass when the wing was painted.

Next time you have an opportunity to see one of Steve's creations, take a close look. You might think it's a work of art, but unlike the great masters of the past, Steve Wolf is still alive and creating.

The author was so enamored with Steve she married him in 2003. ✈

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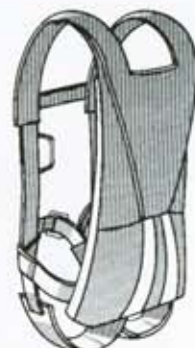
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By DJ Molny, IAC 25097



The weather was decent, and I looked forward to putting some cross-country miles behind us before sundown. My partner, Mark Butler, was in the front seat of our Extra 300L. I would fly, and he would navigate.

After bumping through summertime haze at 2,500 feet for about an hour, we decided to climb on top of a scattered cumulus layer. Plenty of holes to choose from, but there always seemed to be a tall cloud right in our way. Eventually I saw a good opening and pulled the nose up. As the airplane slowed to 120 knots, it looked as though we might not clear the top of the cloud by the requisite margin. So I pulled some more until the airspeed read 100 knots, with about a 20-degree deck angle and 1,500 fpm rate of climb. We leveled at 8,500 feet and enjoyed the clear smooth air for a little while.

For no reason I can recall, I glanced down at the carbon monoxide detector card and was startled to see that the circle was quite dark. An instant later, a wave of nausea struck. That had to be psychosomatic, though; I felt fine just a few seconds before. And besides, there was no exhaust smell and all of the cabin vents had been wide open ever since takeoff. We were literally being blasted with cool fresh air.

What did the card look like before takeoff? I couldn't recall but felt no other symptoms, so I kept my mouth shut and resolved to be vigilant. ➤



The nausea went away over the next couple of minutes and all seemed well. Then I got the chills and my stomach started churning again. I thought maybe I'd gotten a bad burger at lunch. Keying the intercom, I told Mark what was happening. He asked if I wanted to land and I said no, but promised to keep him posted. The color of the card wasn't changing but it was getting harder to concentrate. I also got dizzy whenever I moved my head.

The sun was warm, and I decided to close some vents to combat the chills. Bad idea. It felt like I was suffocating, so I opened them back up. Then the nausea really kicked in, and I was grateful there was a barf bag stashed up front. I told Mark we had better land, and asked him to pass me the bag.

TAKING ACTION

There was a decent-sized airport about 8 miles behind us, and we agreed that would be the best place to stop. I asked Mark to fly the plane and said I would handle navigation. He chopped the power and turned the plane to the right. I punched the airport ID into the GPS and tried to look up the comm frequencies.

Strangely, only the lat/long showed up. The usual info about runways, frequencies, etc. was missing. So I punched the airport ID in again. Same result.

I looked at the DG and saw our heading was 90 degrees off. Was Mark getting loopy too? I told him to turn another 90 right, and told him I wasn't able to get the frequencies from the GPS database.

Then it dawned on me: I had omitted the "K" prefix from the airport ID, so the GPS looked up

the nearby VOR instead. Talk about mental deterioration! I've been using that GPS for five years and the last time I made that particular mistake was about four years and 10 months ago.

Now we were down to 3,500 feet and headed in about the right direction. My head cleared somewhat and my stomach calmed

landing was good enough. Nothing to write home about, but I've done worse on other occasions. By then my powers of concentration had been used up, though, and the roll-out was pretty sloppy.

I shut the engine down and popped the canopy as soon as we pulled up to the terminal. The nausea was mostly gone, but strong sensations of mental fatigue, physical fatigue, and dizziness remained. Mark felt the same symptoms as soon as he tried to stand up.

DIAGNOSING THE AIRPLANE

The muffler had recently been re-welded, and it was the obvious suspect. A friendly mechanic on the field offered to help even though it was quitting time on a Friday. He and Mark quickly uncowed the airplane while I sat down and tried to gather my wits.

To our surprise the muffler looked fine, as did the shroud and cabin heater box. The exhaust pipes looked fine as well. So what was new? Why did this suddenly happen after putting more than 500 hours on the airframe?

Suspicious shifted to the left lower wing root seal, which had been replaced just before the flight. We noticed significant gaps between the seal and the underside of the wing, up to 1/2 inch. The clockwise prop wash tends to throw exhaust gases against the underside of the left wing, and that high-pressure air could be coming into the cabin despite all the open vents. Our slow steep climb would have tightened the corkscrew of prop wash and increased the high-pressure area under the wing.

And there may have been another factor at work. Like many planes, the Extra's cabin pressure is lower than ambient. To reduce drafts,



I looked at the DG and saw our heading was 90 degrees off. Was Mark getting loopy too?



the plane if I was up to it, since he was rusty at flying from the front seat. I agreed and promised to let him know if I needed help.

The pattern approach and pre-landing checks went fine, and the

we had fashioned a baffle from imitation leather, added grommets at the corners, and zip-tied it to the fuselage structure in the tail. This eliminated 90 percent of the draft, but now we had to wonder whether it had contributed to the problem.

DIAGNOSING THE PILOTS

Mark called his wife to let her know where we were and what had happened. Being a former emergency room nurse, she called Poison Control for advice and then ordered us both to the ER.

I didn't feel any worse but then again I didn't feel much better, so we dutifully agreed to go. Mark drove the courtesy car as if he had had a few drinks. By the time we got there, we had been on the ground for more than two hours.

The ER staff was friendly and reasonably efficient. They drew arterial blood from the wrist and sent it to the lab. The ER doc came by a while later with the results, which were only slightly elevated.

Although carbon monoxide

prevents oxygen from bonding to hemoglobin, it turns out the body will expel the CO in a matter of hours. However, exposure is cumulative, so getting away from the source is imperative. The doc said we should be fine after a good night's sleep, and he was right. We found a place to eat and a decent motel and called it a day.

The next day, we found we were still a long way from home with an airplane that had just tried to kill us.

We decided to fill the gap in the wing root seal with silicone caulk, remove the baffle from the tail, disconnect the cabin heater, and tape up incidental openings around the fuel drains and such. Because the detector card was contaminated and the local FBO didn't carry replacements, we bought a \$20 home CO detector at Wal-Mart and zip-tied it next to the pilot's seat.

We flew another seven hours over the next two days without any further problems, and haven't had any difficulties since. Based on our

previous history with the plane and the good condition of the exhaust system, we are confident that the wing root seal was the culprit.

CONCLUSIONS

We came away with a number of lessons from this trip. 1) You can get carbon monoxide poisoning with the vents wide open. 2) You can get CO poisoning without the exhaust system being faulty. 3) The symptoms vary widely. Mark and I were both impaired, but he felt okay and I felt awful. 4) Just a few minutes of exposure (during the steep climb in our case) is enough to make you quite ill. 5) This isn't necessarily a type-specific problem. Exhaust wants to enter the cabin via the wing root during low-speed high-alpha operations in any low-wing or biplane design. 6) Install a monoxide detector card and pay attention to it; it works.

But the most important lesson is also the easiest one to remember, although it's sometimes the hardest one to actually do: If you feel sick, land. ✈



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Steve Morris	38838 Ridge Road; Agate CO 80101	303/621-2835			N94rv@aol.com
Dr. Richard Rihn	739 Hamilton Drive; Pleasant Hill CA 94523	925/938-4236	925/938-4036		Rihnaico@aol.com
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Norm DeWitt	148 Magnolia Drive; Atherton, CA 94027	650/321-8499	650/281-3343		norm.dewitt@gmail.com
Vicki Cruse	849 East Harvard Blvd. #313; Santa Paula, CA 93060	805/484-8442		805/490-0367	vcruise@earthlink.net
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Tony Sauerbrei	2230 - 27th Avenue; Grand Forks, ND 58201	701/777-7939			sauerbrei@yahoo.com

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Bob Buckley – IAC Scoring Program	6090 Fescue Drive; Colorado Springs, CO 80918	719/721-8729 (B)	719/277-7017 (H)	719/338-7961	BwanaBob@Adelphia.net
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Allyson Parker-Lauck	4195 Brudenell Drive; Fairfield, CA 94533	707/427-8516		707/580-1791	aplauck@gmail.com
Scott Poehlmann	6073 Los Pueblos Drive, El Paso, TX 79912	915/307-6450	915/545-6710		Scott-p@texas.net
Lisa Popp	P.O. Box 3086; Oshkosh, WI 54903-3086	920/426-6574	920/426-6865	920/203-9157	lpopp@eaa.org
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Linda Hamer	20483 Meridian Road; Peru, IL 61354-9801	815/223-8596	815/223-6818		lhamer@therap.net
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Mr. Bob Davis	910 Woodland Drive; Woodstock, IL 60098	815/338-4705	815/338-4705		bdavis@owc.net
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Greg Dungan	46152 Levitan Way, Great Mills, MD 20634	301/994-0083		240/925-0980	greg.dungan@verizon.net
LEGAL COUNSEL					
Louis Andrew Jr.	P.O. Box 147; Fond du Lac, WI 54936-0147	920/921-6000	920/921-0226		landrew@eaa.org
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Mike Heuer	4547 Woodlawn Circle West; Collierville, TN 38017	901/850-1301	720/294-5609	901/230-9006	mike@mheuer.com
Klein Gilhousen	599 High Tower Road; Bozeman, MT 59718	406/586-2517			kleing@qualcomm.com
Martha Martin	3279 La Villa Road; Grapond, TX 76449	940/779-3986	940-549-2930		davidmartin@netcommander.com
Vicki Cruse	849 East Harvard Blvd. #313; Santa Paula, CA 93060	805/484-8442		805/490-0367	vcruise@earthlink.net
Howie Stock	2917 Raycraft Road; Woodstock, IL 60098	815/338-4584	815/338-8622	815/341-9837	iacvp@aol.com
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Human Factors					
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Technical Safety					
Vicki Cruse	849 East Harvard Blvd. #313; Santa Paula, CA 93060	805/484-8442		805/490-0367	vcruise@earthlink.net
Doug Partl	11754 Lighthouse Lane; Palos Hts., IL 60463	708/923-0245			Dmcf@msn.com
SUN 'N FUN					
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GENERAL INFORMATION & MEMBER SERVICES

CHAPTER RELATIONS

Troy Toelle Chap. Office, P.O. Box 3086; Oshkosh, WI 54903-3086 920/426-4876 ttoelle@eaa.org

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Technical Advisor

by VICKI CRUSE
vcruse@earthlink.com

Extra 300L Front Stick

In the November column, one of the items was a control stick in the front seat of an Extra that appeared to have been cut off and reinserted with two bolts, one of which caused the stick to jam when the bolt became hung up on the front passenger's crotch strap buckle. After the publication, the owner of the airplane wrote back to me to say that in his paperwork for the airplane, he found an FAA-authorized field modification (Form 337) for the front control stick assembly to be removable when not in use. This work was conducted in 1997 and approval from the FAA was obtained by Aerosport in St. Augustine, Florida. Nonetheless, he emphasized the need to have the head of the bolt facing aft and the nut forward to prevent such hangups with the passenger belts.

Pitts S-2B Seat Back

Andrew Connolly

While preflighting my Pitts S-2B for a Sportsman flight at the Delano, California, contest, I found a piece of wood approximately 2 inches by 1/2 inch by 3 inches in the tail of the airplane, lying on the tail wheel seat post. I dug it out and thought it looked like a short section of wing spar. Panic! But after a bit of head-scratching and looking around, I determined the piece had come from the pilot's seat back.

The Pitts has a removable plywood seat back, with a central stiffener and four corner blocks to help locate the back in the fuselage frame. The four corner blocks and the central stiffener are just glued to the plywood seat back. Looking at the glue pattern from the block that came off, it's clear the same attention to detail in getting a good glue bond and making sure excess glue squeezes out from the joint—commonly done in wing parts—was not done here. Over time, the forces taken by the seat back resulted in the glue bond failing, and one of the corner pieces was free to start flying around in the tail of the plane.

We glued the block and added screws from the plywood side into all four blocks and the central stiffener of the seat back to prevent future problems. Small pilot holes were drilled for each screw in the seat back and blocks, and the screw coated with glue and screwed in. By doing this, if the glue bond between the block and the plywood fails, the screws will prevent the block falling off into the rear of the plane.

Lesson learned: Always inspect the tail of your plane before you fly, even if you're the only one who flies the plane. You never know where things can come loose, and it's often from the most unexpected places.

It's Always Something

Greg Kuehner

My Pitts S-2B is SN 5047, built in June 1984, rebuilt in 1998 at Aviat, and the original engine was overhauled in 2001 using Millennium cylinders. I have flown it for almost two years and have about 75 hours in it. Shortly after I purchased it I noticed a gap between the rear upper Barry mount and the engine mounting lug.

Following the advice of Danny Adams at Aviat, I replaced the mounts with standard units, Barry PN 96005-1. After about 40 hours I removed the nose bowl for repainting and discovered

a large "smile" caused by the alternator drive pulley and heavy rubbing of the starter nose section against the lower half of the bowl. Upon further inspection, I discovered the fuel servo airbox and the alternate air door actuating arm were striking the lower cowl. I shimmed the lower Barry mounts with a thick washer behind them, but that did not totally eliminate the cowl interference problems. I then shimmed the top mounts to close the gap between the front face of the rear mount and the rear of the engine mounting lug. The unintended consequence of these actions was to raise the vibration level in the cockpit significantly.

Another Pitts pilot told me about the larger-diameter Barry mounts he was installing and suggested I use them too. He gave me a copy of the FAA 337 so I would know what parts to order. The shimming held the engine well enough to allow the replacement of the mounts to be postponed until the fall, to coincide with the annual inspection. The only explanation I can offer as to why the engine mounts failed so soon is, the rubber compound was not hard enough for some reason.

My mechanic allows me the opportunity to do an owner-assisted annual inspection. While awaiting my scheduled appointment with him, I got a head start by removing panels and inspection covers. I discovered the alternator drive belt had stretched, and the previous owner had moved the alternator about an inch down the adjustment arm, lowering the alternator too much and creating the nose bowl strike problem. My mechanic looked at the belt that was on the engine and raised a concern that it didn't look like a Lycoming part. It had a Gates part number on it, and I found it was listed in the auto parts section of the Gates online catalog. I ordered the correct Lycoming belt from Aircraft Spruce.

In order to change the belt, the prop had to come off. The worn condition of the starter ring gear was already known, so a look at the starter was in order. The inspection revealed evidence of overheating and the drive gear being thrown against the back of the ring gear while the engine was running. The starting system fell into the three-strikes-and-you're-out category. I thought



Notice how the two bolts are holding the two-piece stick together.

a new lightweight starter should be used to eliminate the nose bowl interference.

The starter I chose was the B&C (PN 315-100-2). I was already leaning toward the B&C because the company had been in the business of making lightweight starters longer than any of the other brands, and the B&C starter is listed in the optional equipment list in the Weight and Balance section of my POH. The cranking speed is truly amazing, and the nose bowl interference would be gone.

However, there is an installation problem with the B&C for which I was not prepared. The problem is hinted at in the installation instructions, which say a modification to the anti-torque link between the alternator mount and the starter "may" be required. The instructions should be rewritten to say the link most likely will need modifying. A new link is required because the distance between the alternator mount on the engine and the lug on the B&C starter is about 1/2 inch shorter than when the Prestolite starter is used.

The plan my mechanic and I first came up with was to flatten the existing link, cut it shorter, drill a new hole, and use washers to fill the offset between the alternator bracket and the mounting lug on the starter. I purchased the starter from Aircraft Spruce but called B&C for assistance. I spoke with the chief engineer, and he advised me the company had designed a link (B&C PN 403-405 for a stock Lycoming IO-540), machined from 4130 steel and cad-plated, that would do the job. It was sent overnight, and it fit perfectly.

Because the link is straight with a machined "bushing" on the end that mates to the alternator mount, not bent into an "S" curve as is the original, a longer bolt is required to mount it. A 3/8-inch by 2-inch bolt is just right. Steel lock nuts were substituted for the original castellated nuts.

The larger Barry mounts made for the Piper Malibu (Barry PN 94110-02) are a great improvement over the smaller-diameter factory mounts. I added a large-diameter thick washer (AN970-8) behind the lower mounts, and the crankshaft turned out to be exactly centered in the nose bowl under static conditions on the ground. All new hardware was used. AN8-54 bolts were used in the lower mounts, in lieu of the standard -53 bolts, to allow two thick washers, one regular and one large diameter, to be used. The vibration level with the new mounts is significantly lower than with the factory mounts I had shimmed to get the engine up where it needed to be.

An FAA field modification approval is necessary for the new mounts, but it was not hard to get. I was told Ray Williams in Nashville first developed the use of these mounts. The folks at Barry Controls were very helpful in providing continuing airworthiness data. I was the second applicant I know of to get approval from the Cincinnati FSDO.

My annual inspection was finally finished after two weeks of hard work. Keeping old airplanes airworthy is not easy. I flew a test hop, and the flight went very well. The new starter and the larger Barry mounts were worth the effort and expense.

If you would like help getting the FAA field mod for use of the Barry mounts, Greg can be reached at gj.kuehner@sbcglobal.net.

Online Lycoming Videos

Textron Lycoming has recently added 13 videos to its website, covering topics such as engine installation, start-up, and break-in, as well as maintenance information such as oil specs and consumption and proper leaning techniques. Check it out at www.lycoming.textron.com/main.jsp?bodyPage=/videos/index.html.

Many thanks to the readers who contributed to the column this month. My repeated requests for information seem to be working. Please keep it up, as material is always needed. ✈

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POWER PRIMARY



B	Contest:	Category: Primary
	Date:	Pilot's No. <input type="text"/>
Program: Known		

wind direction

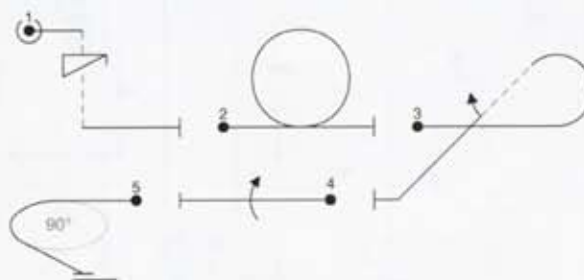


Fig 1	1.63 8.11.14	10 5	15
Fig 2	7.5.1	10 10	
Fig 3	8.42.1 9.1.4.2	10 4	14
Fig 4	1.1.1 9.1.3.4	2 6	10
Fig 5	2.2.3	3 3	
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POWER SPORTSMAN

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Program: Known		



wind direction

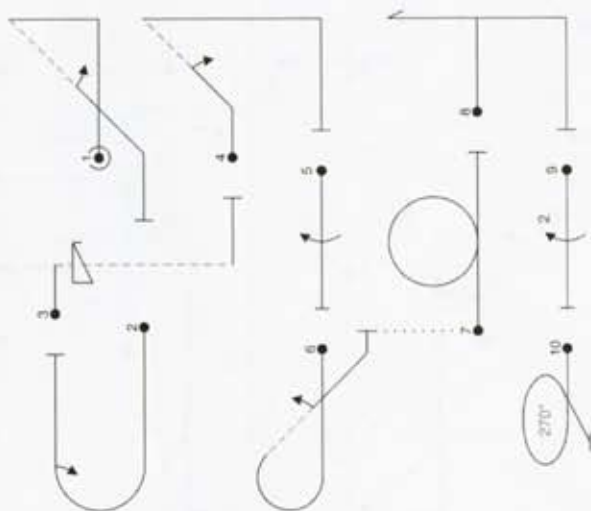


Fig 1	1.63 8.11.14	10 5	15
Fig 2	7.5.1	10 10	
Fig 3	8.42.1 9.1.4.2	10 4	14
Fig 4	1.1.1 9.1.3.4	2 6	10
Fig 5	2.2.3	3 3	
Fig 6	1.1.1 9.1.3.4	2 6	10
Fig 7	7.5.1	10 10	
Fig 8	8.42.1 9.1.4.2	10 4	14
Fig 9	1.1.1 9.1.3.4	2 6	10
Fig 10	2.2.3	3 3	
Total K = 127			

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POWER INTERMEDIATE

IAG International Association of Great Lakes

Contest: **B** Date: **2006** Program: **Known** Category: **Intermediate** Pilot's No.

wind direction

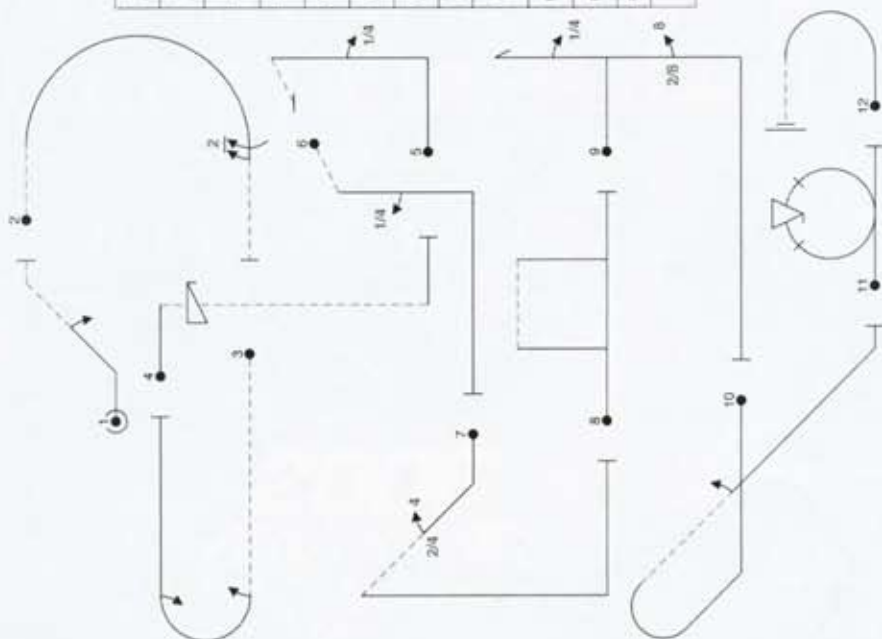


Fig 1	13.1	2	13
Fig 2	8.23.6	12	19
Fig 3	8.23.2	4	14
Fig 4	8.23.2	10	15
Fig 5	8.23.2	6	16
Fig 6	8.23.2	2	11
Fig 7	8.23.2	12	18
Fig 8	8.23.2	14	14
Fig 9	8.23.2	17	16
Fig 10	8.23.2	11	16
Fig 11	8.23.2	11	11
Fig 12	8.23.2	8	8

Total K = 189

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AC

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POWER ADVANCED

IAG International Association of Great Lakes

Contest: **B** Date: **2006** Program: **Known** Category: **Advanced** Pilot's No.

wind direction

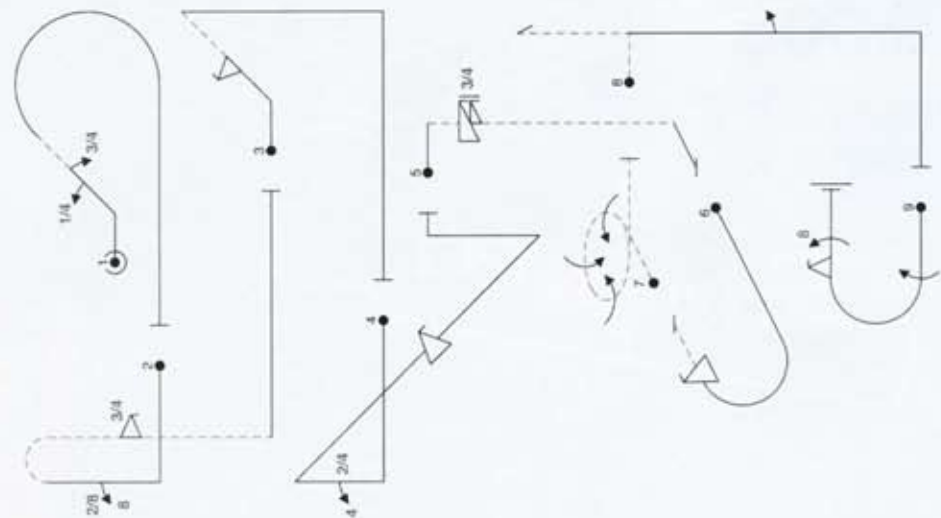


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Fig 2	8.23.1	7	25
Fig 3	8.23.2	12	25
Fig 4	8.23.2	22	42
Fig 5	8.23.2	10	13
Fig 6	8.23.2	8	17
Fig 7	8.23.2	18	18
Fig 8	8.23.2	22	26
Fig 9	8.23.2	8	40
Fig 10	8.23.2	11	15

Total K = 238

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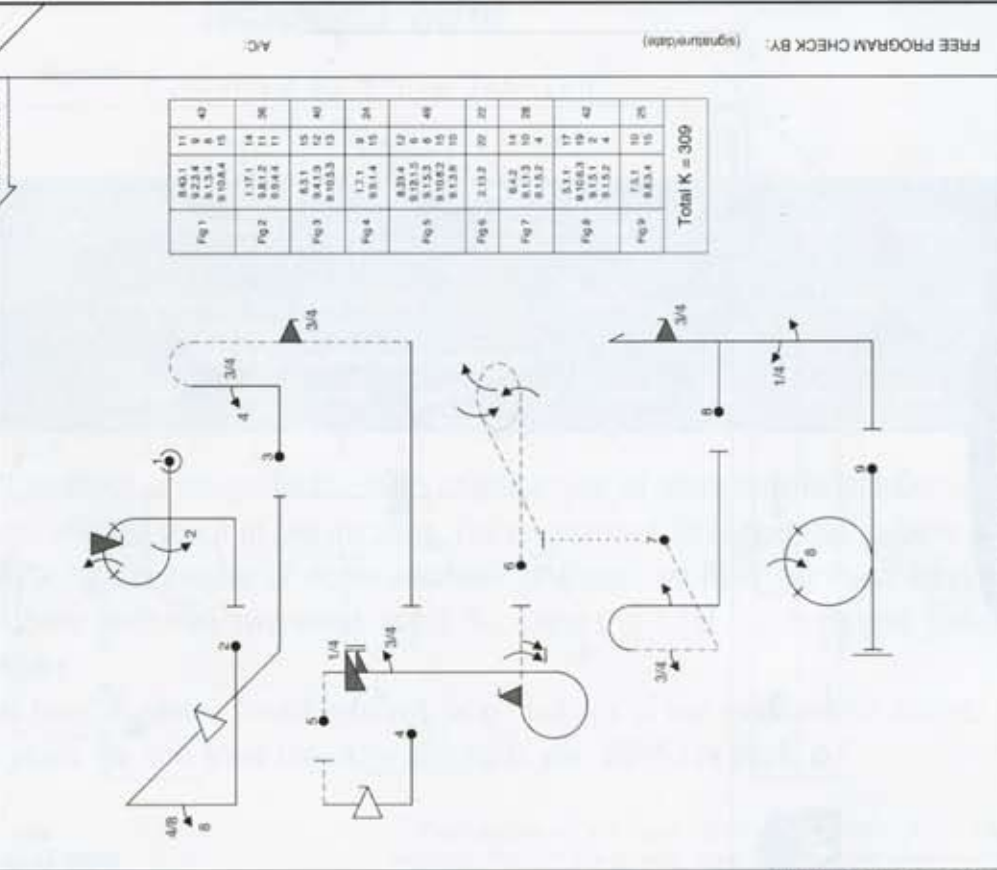
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B	Contest	Category: Unlimited
	Date: 2006	Pilot's No.:
	Program: Known	

wind direction



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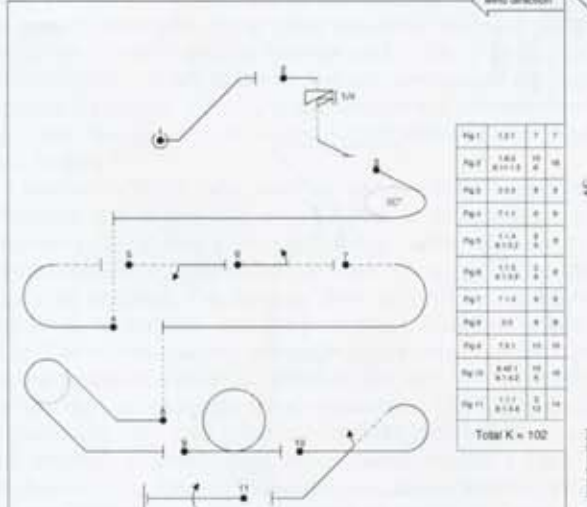
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GLIDER SPORTSMAN 1



B	Contest	Category: Glider Sportman
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	Program: Known I	

wind direction



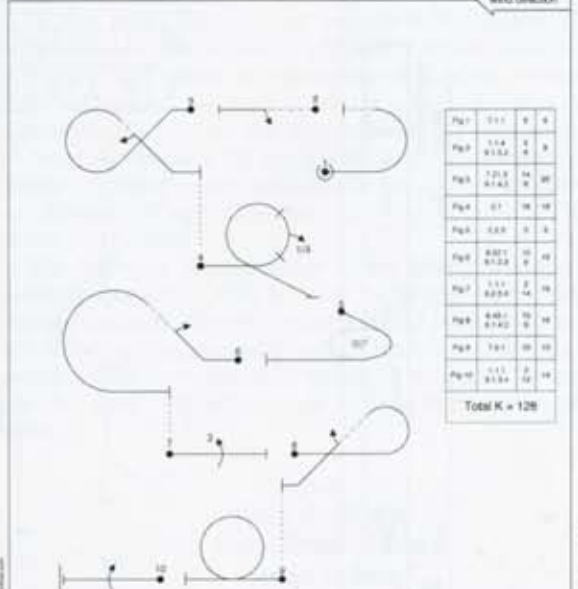
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GLIDER SPORTSMAN 2



B	Contest	Category: Glider Sportman
	Date: 2006	Pilot's No.:
	Program: Known II	

wind direction



GLIDER FREE PROGRAM CHECK BY: (signature/date)

GLIDER INTERMEDIATE



B	Contest:	Category:	Glider
	Date: 2006	Program:	Intermediate
		Known	Pilot's No.

Pilot:

wind direction

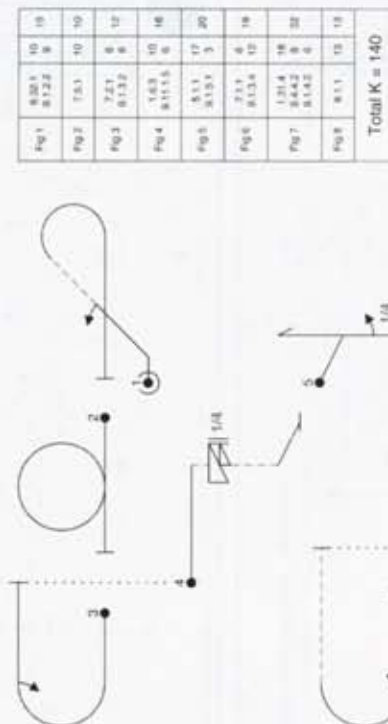


Fig 1	6.30.1	10	10
Fig 2	6.12.2	9	10
Fig 3	7.5.1	10	10
Fig 4	7.2.1	8	12
Fig 5	6.13.2	8	12
Fig 6	1.6.3	10	16
Fig 7	6.11.5	0	16
Fig 8	5.1.1	17	20
Fig 9	3.1.9	5	20
Fig 10	7.1.1	6	18
Fig 11	6.13.4	12	18
Fig 12	1.31.4	18	22
Fig 13	8.4.2	0	22
Fig 14	8.1.4.2	0	13
Fig 15	8.1.1	13	13

Total K = 140

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B	Contest:	Category:	Glider
	Date: 2006	Program:	Unlimited
		Known	Pilot's No.

Pilot:

wind direction

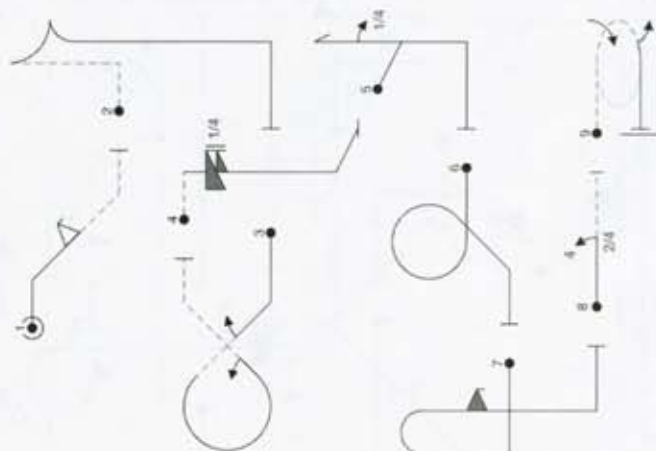


Fig 1	1.2.3	8	20
Fig 2	8.4.2	13	17
Fig 3	6.1.4	17	17
Fig 4	7.2.1	16	34
Fig 5	6.1.3	9	34
Fig 6	6.1.2.2	9	17
Fig 7	1.7.4	9	17
Fig 8	6.12.5.3	8	17
Fig 9	5.1.1	17	26
Fig 10	3.1.1.1	9	26
Fig 11	6.4.1	11	11
Fig 12	5.1.1	13	26
Fig 13	8.10.2	13	26
Fig 14	1.1.3	9	10
Fig 15	8.4.2.2	8	10
Fig 16	2.1.2	26	26

Total K = 191

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Mishaps Data

Compiled by Bruce Johnson

MISHAPS BY MONTH

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2004	0/0	0/0	1/1	1/1	0/0	0/0	1/1	2/3	1/2	1/1	0/0	2/2
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

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.

MISHAPS BY YEAR

YEAR	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
MISHAPS	12	20	26	21	24	20	18	12	9	15	9

There had been only 10 aerobatic mishaps for the 2005 calendar year at press time in mid-December. This is the second-lowest mishap count in two decades. The members of this organization have done a fantastic job of addressing the causes of major aerobatic mishaps; we have cut these tragedies more than in half. You have furthered awareness about the causes of fatal accidents and fostered mentoring of new members.

Where do we go from here? It seems possible to cut fatal mishaps of our members by another 50 percent in the next 10 years. We now know the path; it is up to you. What say you?

Final
Sukhoi SU-29—N92CG
Santa Fe, New Mexico—1 Fatal
October 02, 2004

The Russian-built aerobatic airplane had taken off just prior to the start of the air show. The airplane held outside the show area for a T-33 jet, which was the show's first performance. The pilot then went into his routine.

The airplane was approximately 1,500 feet agl when the pilot entered his second maneuver, a torque roll. On reaching its maximum height, the airplane was observed to tail slide and enter an inverted spin. A witness said, "The pilot attempted to recover but didn't make it. The airplane struck the ground upright, in a slight right bank and nose down attitude. On contact with the ground, the airplane exploded and was engulfed in a fireball."

Another witness, also one of the air show's performers, described the torque roll. He said that in this maneuver, the airplane pulls up into a vertical climb at full throttle. As the airplane runs out of airspeed, torque from the engine and propeller turns the airplane. The airplane then falls off one direction or the other, nose down, and the pilot flies the airplane out of the dive. The witness said he saw the airplane come out the bottom of the smoke and enter an inverted flat spin. The witness said he saw the airplane make three revolutions. The witness said he thought the pilot had gone too far. "He came off the throttle, the rotation stopped, then the airplane yawed. I heard the engine come in. The airplane came around in a positive attitude. He was getting low. He was upright in a spin. He went to full power. He made a turn and a half and then hit [the ground]."

An examination of the airplane revealed no anomalies. A former importer and dealer of SU-29s, who was also a pilot and mechanic who had flown and maintained SU-29s, stated that at the altitude the accident airplane was operating, the pilot cannot reduce power at all during the torque roll maneuver. He said, "If you do reduce power, the airplane will fall off wrong and you will not have enough altitude to recover."

Examination of recorded video/images taken of the flight sequence through the ground impact showed the airplane come out of the torque roll into an inverted spin with full left rudder and slight upward elevator controls. The airplane descended in an inverted spin attitude for three revolutions before the airplane made a clockwise roll around its longitudinal axis, placing it in an upright, nose-down attitude. About 3.4 seconds prior to the airplane coming out of the inverted attitude, the rudder moved toward neutral. The airplane entered a left downward spiral.

At this point, the airplane was less than 600 feet agl. The airplane made 1.5 left-turning spirals. On completion of the first spiral, the rudder was deflected left and the elevator was deflected upward. At the end of 1.5 spirals, the airplane was approximately 150 feet agl. At this point, the airplane stopped its spiral motion and fell straight down to the ground in a 47-degree nose-down pitch attitude. On impact, the airplane's rudder showed full right deflection. The elevator was full up (full aft stick deflection).

The National Transportation Safety Board determined the probable cause(s) of this accident to be the pilot's failure to maintain aircraft control, resulting in the inverted spin, spiral, and subsequent impact with terrain. Factors contributing to the accident were the inadvertent stall/spin, the spiral, low altitude, and the pilot's delayed attempt to recover from the spin and spiral.

Final
Pitts S-1S—N230SB
Liberal, Kansas—1 Fatal
October 24, 2004

A witness reported seeing a small airplane go into a "backward spin, then it flipped upside down and stayed [in] a spin until it disappeared over the hill." A second witness stated that he saw an airplane "doing tricks." He continued: "I watched him for a few minutes, then he was doing this crazy stunt up in

Continued on page 31

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Continued from page 29

the air. He was upside down going in circles. And I was noticing that he was getting closer to the ground. Then all of a sudden he wasn't pulling up." He noted the airplane descended until it impacted the ground.

The Pitts S-1S came to rest inverted on level terrain approximately two miles west-southwest of LBL. The engine cowl, upper wing assembly, and vertical stabilizer exhibited crushing damage. The flight controls remained attached to the airframe. Control continuity was confirmed from the empennage to the cockpit area and from the ailerons to the wing roots. Cable breaks exhibited a frayed condition consistent with overload tensile failure.

One of the co-owners of the aircraft reported that they had owned it for approximately 20 years. They were reportedly in the process of negotiating a trade with the accident pilot involving the aircraft. During this time, the owner stated that the accident pilot had permission to fly the aircraft.

He noted that the accident pilot had told him that he had experience in two-seat Pitts aircraft and with aerobatics in general.

The owner stated that he had flown the accident aircraft the evening prior to and the morning of the accident. He reported that he conducted some takeoffs and landings during the evening flight and performed some aerobatic work during the morning flight. He stated that the aircraft performed normally. He noted that he was not aware of any discrepancies with the aircraft.

Federal Aviation Administration records indicate the accident pilot held a private pilot certificate with a single-engine land rating. He also held a mechanic certificate with airframe and powerplant ratings. He was issued a third-class airman medical certificate on November 11, 2002. His pilot logbook was not located. He reported his total flight time as 1,000 hours on his medical certificate application.

The National Transportation Safety Board determined the probable cause(s) of this accident to be the pilot's failure to maintain control of the airplane while performing aerobatic flight maneuvers, resulting in an in-flight collision with terrain. ✈

Acro Pilots

by Vicki Cruse

Hooked on Aerobatics

What experience drew you to competitions? In the fall of 2003, I took an aerobatic ride with Wayne Handley. It was amazing! As we were taxiing in, Wayne said, "This is going to be a very expensive ride for you, isn't it?" He was right; he knew I was immediately hooked. After I bought my airplane and started flying with him, he suggested that I fly contests. I was hesitant to do so because I didn't know anyone who flew contests. But one day at Pine Mountain Lake I met Todd Whitmer, who was flying in lots of contests, and Todd told me how much fun it was and convinced me to attend my first contest in Delano, California, in September 2004.

What was your first experience with aerobatics? Spin training was required when I did my primary training. I learned to fly in a 1946 Taylorcraft, and my instructor taught me to do loops, rolls, and spins. I also took a 10-hour aerobatic course in a Citabria with Amelia Reid in 1984. However, life took me in a much different direction, and I forgot how much I enjoyed aerobatics until I came back to it almost 20 years later.

Tell me about your airplane. My Extra used to belong to air show pilot Rocky Hill. Rocky originally bought the plane as a wreck to use for parts. But Ken Erickson, after looking at the wreck, told Rocky that he could rebuild the plane. He had the fuselage repaired by a local race car builder. As the story goes, Ken went to take a look at it one day and told the guy, "Beef it up; Rocky's going to fly it." Rocky had a custom, one-of-a-kind wing with full-span ailerons built for the plane by Composites Unlimited in Scappoose, Oregon. Hence the plane is super-strong, and has an incredible roll rate. It also has a Lycon-built engine, modified for additional horsepower.

How did you obtain this airplane? My airplane belonged to a friend of Wayne Handley, Jim "Fang" Maroney. Wayne knew that it was going to be for sale before it was ever advertised. He also knew the plane very well, having flown with both Fang and Rocky. So I flew my Duke to North Dakota through the blowing snow in November 2003 to see it. We came to an agreement and Fang delivered it to me in March of 2004, after the winter season finally broke in North Dakota. The ironic thing is that Rocky lives only a few miles from me in Saratoga, and now the airplane is back home again at Reid-Hillview, where he used to hangar it.

What is your most memorable contest moment? Placing in a Sportsman flight in Ephrata, Washington, earlier this year. I'd been to two contests before that and didn't win a flight. It's enough to keep you addicted—like in golf when you get a good shot. It makes you want to come back for more.

What is your favorite part of a contest? Meeting and getting to know the other competitors. The friendships that I've made are absolutely the best part. There are fun people in aerobatics! Being around all the cool planes is also great.

Tell me a person or persons in the sport you admire: I admire many people because there are many incredible aerobatic pilots. But I would have to say that Wayne Handley tops

Vicky Benzing



City, State: Saratoga, California

Occupation: Hi-tech Professional

Family: Husband—Jeff, Stepchildren—Kevin and Megan

Pilot certificates: Private in 1982, Commercial, Instrument, MEL, Rotorwing

Aircraft flown: Currently owns a 450 Stearman, Luscombe 8E, Beech Duke, Hughes 269A helicopter, and an Extra 300.

E-mail address: vkflyer@aol.com

my list. Wayne is the coach and mentor for many aerobatic competitors and air show performers. He is awesome—he can make a plane do almost anything—and what's even better, he can teach others to do the same.

How does your husband, Jeff, feel about your aerobatics? This sport requires a lot of time and dedication, and Jeff has always been very encouraging and supportive of all my endeavors.

Where would you like to see yourself going in the sport? I would like to continue to build my skills. My goal is to eventually get to Unlimited, but sometimes when I am practicing for Intermediate, I wonder if I'll ever get there. This sport is very physically and mentally demanding.

What food would you most wish to see served at a contest banquet? The regional specialty. For instance, in Delano it would be Mexican food.

The first thing one notices about Vicky is her airplane, without a doubt. It has to be one of the most eye-catching airplanes around, and it attracts a lot of attention. Meeting Vicky, you quickly realize she is not nearly as flashy as her plane, with the exception of her many varieties of tie-dye shirts. In a year's time, aerobatics has taken her from California to Canada to the Nationals in Texas. Wayne Handley was definitely right when he told her she'd be hooked on aerobatics. ✈

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