

**SPORT**

# Aerobatics

November 2012

OFFICIAL MAGAZINE of the INTERNATIONAL AEROBATIC CLUB



**2012**  
**U.S. National**  
**Aerobatic Championships**



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*At the 2012 U.S. National Aerobatic Championships, 95 competitors descended upon the North Texas Regional Airport in hopes of pursuing the title of national champion and for some, the distinguished honor of qualifying for the U.S. Unlimited Aerobatic Team.*

—Aaron McCartan

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## THE COVER

This photo was taken at the 2012 U.S. National Aerobatic Championships competition as a pilot readies to dance in the sky. Photo by Laurie Zaleski.

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## Leading by example

A source for inspiration

### WHILE AT NATIONALS THIS YEAR,

I was privileged to visit with pilots at all levels of competitive flying, both powered and glider. What I discovered is that the grassroots are growing strongly within the IAC.



Rob Holland and Aubrey Underhill

I had an opportunity to eat dinner with Unlimited Champion Rob Holland and team captain Mike Steveson, along with other competition pilots. During dinner, Rob introduced me to Aubrey Underhill, a Sportsman pilot flying his Pitts S-2C. The story, as I understood it, was that Aubrey had been quite busy with his other duties and was pretty rusty in the box. He really had no intention to fly at Nationals until Rob gave him a kick in the pants—he would fly as safety pilot in the front seat of Aubrey's Pitts!

Rob Holland does not take nationals lightly. He is one of very few pilots in the country who makes his living exclusively from flying air shows. He takes special time off to prepare for Nationals, and this year was even more important because it was a team selection year for next year's World Championships. You'd think with that kind of pressure,

the last thing on his mind would be helping a competitor in a lower category—but that's the point. Rob is going out of his way to show the competition community that we are all in this together. He's leading by example, and what an example it is!

Doug Jenkin's day job normally puts him at the controls of an F-15 fighter. In fact, he had just returned to the U.S. after a stint in Afghanistan before this year's contest. While on tour, he convinced his wife to let him purchase a Pitts sight unseen. He'd have to wait one long month before seeing the airplane for the first time.

After getting acquainted with his new airplane, a Pitts S-1S, he decided to try his hand at the Primary category at Nationals. He made the three-hour



Doug Jenkin's Pitts S-1S

trip in his open-cockpit airplane and flew to a respectable fourth place overall—not bad for his first contest ever!

Look for Aubrey and Doug's stories, along with others, in future issues of the magazine. Inspiration can come from the darndest places.

IAC

Please submit news, comments, articles, or suggestions to: [reggie.paultk@gmail.com](mailto:reggie.paultk@gmail.com)



# A satisfying experience

## The flight to Nationals 2012

**I ALWAYS ENJOY MY ANNUAL** trip to the Nationals and back. There is no need for me to go over any of the statistics, the scores, the schedule, and other such minutia, all of which was made available on the Nationals website in real time. Rather, I am thinking about the flight to Nationals itself, and hoping that some personal notes about the experience will encourage some of y'all to take the leap and fly to Texas next September. First, however, is one detail that bears repeating: Our 2013 U.S. Unlimited Team members are Rob Holland, Goody Thomas, David Martin, Michael Racy, Nikolay Timofeev, Debby Rihn-Harvey, Robert Armstrong, Melissa Pemberton, Hector Ramirez (first alternate), and Mike Steveson (team manager). I was judging Unlimited, and we saw some truly outstanding flying by these men and women. My personal favorite moment: Robert Armstrong's rendition of a down loop with a double roll in the second Unknown. Wow!

Dawn arrived in Spokane, Washington at 6:36 AM on September 21. As usual, I was behind schedule and lit the Lycoming off at 6:45. Thinking the tower opened at 7:00, I announced on the common traffic advisory frequency (CTAF) my intention to taxi to runway 3 for departure . . . the wind was calm and 3 is aimed in about the right direction. The tower greeted me, approving my plan. Surprised me! Anyway, off the ground, turn 60 degrees right, and I'm climbing toward Mullan Pass. North Texas Regional (KGYI) is 1301 nautical miles (NM) from Felts Field by my favorite route,

which is basically Interstate 90 to Sheridan, Wyoming, and then GPS Direct to KGYI. Foreflight predicts 8.1 hours in the air with calm winds, and accounting for the two-hour time change from Pacific to Central time, I have 10:48 of daylight; plenty of time for two fuel stops.

For some reason, I really enjoy long solo flights. The Rockies in North Idaho are beautiful. East of Missoula, the terrain gets a bit harsher with less vegetation, probably because the rocks squeeze the moisture out of the westerly winds, and also because the winters are pretty cold at the higher elevations. Still spectacular. On this day, the weather was forecast to be excellent all the way. But September in Washington, Idaho, and Montana often means smoke, and lots of it. Crossing Bozeman at 9500 feet, the automated terminal information system (ATIS) was announcing visibility of three miles. Sure enough, I could see a circle of ground traveling along with me, with a three mile radius. I was chatting with Bozeman tower as Gallatin Field passed through my moving lens, happy I was well above the murk.

Sheridan is a great fuel stop. The fuel price is good (it's all relative), the folks are efficient and friendly, and it's easy to get a quick Snickers bar and a cup of coffee and get back in the air. South and east of Sheridan, Wyoming, gets real lonesome. I always cross just east of Pumpkin Buttes, about 80 NM out. Or 26 NM southeast of the Crazy Woman VOR, if that's a better reference for you. Their absolutely flat tops are at about 6000 mean sea level (msl),

with some assorted microwave gear on top. I figure those installations must have been built by helicopter. If I happen to be low avoiding headwinds, it's fun to cross the buttes at 100 feet or so. There's absolutely no sign of human habitation. My dad and I used to fly together across this country frequently and his comment always was, "Out here, the jackrabbits carry their own lunch."

The next great stop is Goodland, Kansas. Butterfly Aviation is a friendly, family run FBO. They always remember me from last year, and the office walls are covered with signed photos of air show pilots who have passed through. Someday I'll take them a photo of my airplane and myself. Goodland is only a few miles off the straight line to Sherman-Denison, and I calculate my fuel fill to arrive at KGYI with near-empty wings and a full acro tank for Saturday's practice slot. It usually works out OK.

By the time I'm on the way from Goodland to Texas, I'm always thinking about how wonderful it is to fly across our great country by light airplane. After six or seven hours in the air, it's kind of a spiritual thing. Yes, airspace can be congested on the coasts. But out in the hinterlands, it's just me and my Extra; a tiny speck on a huge canvas, cruising along and loving every minute of it. If you haven't been to the Nationals lately because the flight is too long, come on down to Texas next year. Just being at the Nationals is a great time, but the flight is a satisfying experience in itself.

"The journey is the destination." **IAC**



# 2012 U.S. NATIONAL AEROBATIC CHAMPIONSHIPS

Contest director summary

BY AARON McCARTAN  
IAC 433420

PHOTOS BY LAURIE ZALESKI



**W**hen explaining a complex sport such as competitive aerobatics I am usually challenged with a question—what's the motivation to participate in such a sport? Repetitively I have answered with a programmed response about the experience, pursuit of perfection, and the social environment amongst some great people. Usually I look forward to struggling through an Unknown or trying to conquer the winds aloft. Serving as the contest director didn't afford me the flight opportunities but did present a terrific opportunity to get involved with the club in a different capacity and reaffirm that the individuals in this organization are truly something special.

At the 2012 U.S. National Aerobatic Championships, 95 competitors descended upon the North Texas Regional Airport in hopes of pursuing the title of national champion and for some, the distinguished honor of qualifying for the U.S. Unlimited Aerobatic Team. With minor exceptions the weather did cooperate, and ultimately we were able to complete all of the flight programs. This year marks the first time that all four glider aerobatic categories were present at the Nationals. Equally as significant, this year was the first time all of the major collegiate programs were able to attend! A brief calculation be-

tween three flight programs for all pilots, a fourth flight for power Unlimited to select the U.S. team members and the 4-Minute Free, and 305 flights were flown before the judges during essentially five full days of the competition.

For those in our club who have not attended the U.S. Nationals, it is a very BIG contest that requires some special preparation typically not found at your local chapter contest. There are many tasks such as coordinating sponsorships that begin several months prior. Even the acquisition of Unknown sequences takes special handling. Most contests will elect a jury and the category chief judges as they arrive at the registration table. Not at the Nationals. Simple things like selection of judges, chiefs, jurors, assistants, and more begin far in advance. For that matter so does selection of the contest directors, volunteer coordinator, registrar, and scoring director. The main contest administration starts a recruiting and approval process shortly after the Nationals at the fall IAC board meeting, and the games begin for the next event.

Before I ramble much further into how this event is structured or who did what, I should recognize some people who worked tirelessly to create such an outstanding contest. My experience began as the assistant contest director for the 2011 Nationals under Vicky Benzing who ran a fantastic event. Vicky was



gracious enough to provide some guidance and advice so I had a solid jump on the 2012 Nationals. Another name that should be familiar to everyone is Lorrie Penner. Yes, Lorrie is literally everywhere and has served countless positions with the International Aerobatic Club over several years. Lorrie was kind enough to accept the position of co-contest director for this year and was a constant driving force in keeping the event structured and on track. Next we have Ellyn Robinson serving as the volunteer coordinator. Ellyn took on much more workload than one can imagine but did an outstanding job of delegating and balancing workload amongst the volunteers. Two seemingly thankless jobs that consume a significant sum of time and effort are the position of registrar and scorekeeper. Kathleen Moore worked as our registrar again this year, with computer scoring handled by Stephanie Vidrine and assisted by Lynda Bales. Those three individuals were hidden away in the back of the hangar for most of the contest and took on large workloads and long hours all in an effort to make our contest possible.

Returning as the jury chairman was Jim Ward, a man with an excellent ability to calmly articulate a point and the willingness to hear any issue or complaint. Other jurors included Mike Heuer, Michael Forney, Wayne Roberts, Michael Steveson, Lynne Stoltzenberg, and Klein Gilhausen. The jury at a national championship event does re-

quire a bit more service than one would think. Between approval of figures for Unknowns, approval of Unknown sequences themselves, the occasional protest, and meetings about pressing contest matters, our jury worked diligently to serve the competitors.

Earlier I mentioned favorable weather with minor exceptions. We were blessed with favorable weather throughout the majority of the contest. Our first delay occurred on Wednesday, September 26, when we pushed back the first rotation at the risk of some rain passing through. This caused a small schedule amendment to push the Intermediate category back into the following day. A second rain event passed by on Thursday during the Advanced Unknown sequence but only caused a brief interruption in the flights. During the changing weather on Thursday the wind managed to shift 180 degrees causing the direction of flight to be reversed. This proved to be an interesting challenge for some. Outside of that, we were graced with favorable conditions until after the final flight of the 4-Minute Freestyle at the conclusion of the event.

Prior to the contest it was decided to attempt a Free Unknown format for Unlimited team selection flight. I'll admit that I had to do some research as I was unfamiliar with the procedures to run such a flight. At a typical Nationals, the top 10 placing pilots following the Known in Advanced and Unlimited categories are allowed to submit figures

## Primary Power Consolidated Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	Known	Known #2	Known #3	Totals	O/all %
1	Ben Thomas	Decathlon	N317JR	523.26	542.69	541.51	1607.46	85.051
2	Johnathan Sievert	Decathlon	N317JR	526.73	533.12	512.95	1572.80	83.217
3	Steven Davidsmeyer	Decathlon	N317JR	501.05	521.26	538.59	1560.89	82.587
4	Doug Jenkins	Pitts S-1S	N52B	500.54	543.88	511.59	1556.01	82.329
5	Blair Mohn	Pitts S-2A	N19HC	503.54	527.72	519.08	1550.34	82.029
6	Alexander Sachs	Decathlon	N317JR	501.64	525.60	489.27	1516.51	80.239
7	Joseph L. Watson	Decathlon	N330MS	457.74	428.26	435.85	1321.86	69.940

Contest Director: Aaron McCartlan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Virdrine, Judges: Tim Baker, Daniel Wisehart, Betty Stewart, Charlie Harrison, Lynne Stoltenberg, Tony Wood, Tom Rhodes, Peggy Riedinger, Julia Wood, Kurt Richmond, Marty Flournoy. Judges' Assistants: (not recorded).



BEN THOMAS



JOHNATHAN SIEVERT



STEVEN DAVIDSMEYER



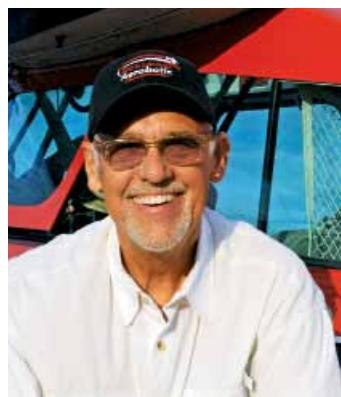
ALEXANDER SACHS



BLAIR MOHN



DOUG JENKINS



JOSEPH L. WATSON

for the Unknowns. All pilots of their respective categories are then welcome to take those figures, construct an Unknown sequence, and submit it to the contest jury. The jury members will inspect all sequences and select one for the category to fly. For a Free Unknown that is typically used at the CIVA-hosted World Aerobatic Championships, all sequences submitted to the jury that are found legal for use are published. Pilots then study all of the published sequences and pick which one suits them best. We used a Free Unknown for the Unlimited second Unknown program only. Several sequences were received, but ultimately four were found legal and published for pilot selection. Of the four that were approved and published only three of the sequences were actually used by the Unlimited pilots. From a contest administration perspective

the workload is fairly demanding. It takes time for the jury to validate all of the sequences; once they are published it takes time for the competitors to analyze and select a sequence. Loading the clipboards for the judging line is much like that of a Free program. It's an interesting concept, but it does take a fair amount of time to administer.

While the goals of the Nationals are to crown our champions of the respective categories and qualify a team for the following year's World Aerobatic Championships, it is noteworthy to mention the attendance of individuals from overseas. While most of us may know Laurie Zaleski, who has been our contest photographer for several years, she was followed by Leif Culpin from the United Kingdom. Leif came to visit on behalf of the British aerobatic club to spectate and photograph but ended

## Unlimited Glider Consolidated Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	Known	Free	Unknown	Totals	0/all %
1	Jason Stephens	Swift S-1	N114EW	1760.80	2151.86	1260.22	5172.89	76.977
2	Klein Gilhouse	Swift S-1	N113TX	1645.28	1833.55	1459.29	4938.12	73.484
3	Paul Jennings	Swift S-1	N114EW	901.21	1784.80	1093.59	3779.60	56.244

Contest Director: Aaron McCartan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Vidrine, Judges: Chris Rudd, Mike Steveson, Wayne Roberts, Doug Sowder, Mark Matticola, Bill Denton, Mike Forney, Charlie Harrison. Judges' Assistants: Marty Flournoy, Ben Freelove, Curt Richmond, John Smutny, Mikhael Ponso, Bruce Ballew, John Ostmeyer.



JASON STEPHENS



KLEIN GILHOUSEN



PAUL JENNINGS

up pitching in for a few tasks and contributed to our pilot profiles on the website and in the score results. Nick Buckenham, developer of the ACRO scoring software, also traveled from the United Kingdom to volunteer at our event. Nick worked as assistant to a chief judge, worked a separate judging line, sat boundaries, and provided tech support on his scoring software. One of our power Unlimited competitors, Francis Barros, traveled from Brazil and flew Mike Ciliberti's Sukhoi. Mr. Barros even registered for the 4-Minute Free! Ben Brazier arrived from Australia in the power Intermediate category flying John Smutny's Wolf Pitts.

As the competition flying came to a conclusion Friday we did host a very active 4-Minute Freestyle with five competitors. As mentioned before, Francis Barros demonstrated the raw power of

the Sukhoi. He was followed by Robert Armstrong, who exhibited maneuvers of high technical difficulty. Paul Jennings flew an incredible demonstration in a Swift glider and reminded us that no, you do not require a propeller to tumble an airframe. Debby Rihn-Harvey flew a masterful performance in her CAP that looked graceful and controlled. The winner of the 4-Minute Free was Rob Holland, who managed to pull off impossible maneuvers and somehow condensed his entire 15-minute air show routine into a 4-minute sequence.

In closing, I'd like to extend a general thanks to everyone who volunteered. There are too many names to list as most of the attendees at this year's Nationals gave selflessly. It has been a tremendous honor to serve the members of our club, and I look forward to seeing everyone again next season!

**WHILE THE GOALS OF THE NATIONALS ARE TO CROWN OUR CHAMPIONS OF THE RESPECTIVE CATEGORIES AND QUALIFY A TEAM FOR THE FOLLOWING YEAR'S WORLD AEROBATIC CHAMPIONSHIPS, IT IS NOTEWORTHY TO MENTION THE ATTENDANCE OF INDIVIDUALS FROM OVERSEAS.**



## Intermediate Power Consolidated Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	Known	Free	Unknown	Totals	O/all %
1	Stanley Moye	Extra 300S	N429HR	1574.98	1714.15	1549.12	4838.25	84.290
2	Bill Denton	CAP 232	N232LR	1545.89	1688.53	1516.61	4751.04	82.771
3	Dave Scott	Pitts S-1S	N8962M	1611.42	1589.83	1524.36	4725.61	82.328
4	F. Paul Russo	Laser 230	N230MC	1544.57	1622.20	1526.26	4693.03	81.760
5	Mark Jacobson	Pitts S-2XX	N52SX	1559.41	1627.81	1497.88	4685.11	81.622
6	Michael Lents	Decathlon	N317JR	1463.16	1683.54	1458.51	4605.22	80.230
7	Anthony J. Hefel	Judy Monosport	N666BJ	1502.14	1644.94	1442.23	4589.32	79.953
8	Tom Rhodes Jr.	DR-107	N515PM	1515.25	1598.97	1469.36	4583.58	79.853
9	Foster Bachschmidt	Extra 330LX	N330FB	1597.47	1654.63	1318.12	4570.22	79.620
10	Benjamin Brazier	Pitts S-1	N240WP	1499.00	1551.17	1386.00	4436.17	77.285
11	John Smutny	Pitts S-1	N240WP	1490.10	1500.55	1420.08	4410.73	76.842
12	Mike Plyler	Staudacher S300	N892M	1269.83	1690.86	1447.74	4408.43	76.802
13	Curt Richmond	Pitts S-2B	N58DE	1499.12	1529.33	1291.22	4319.67	75.256
14	Matthew Lane	Yak 55M	N55YZ	1260.42	1600.16	1423.84	4284.42	74.642
15	Chuck Cohen	Extra 300L	N67RR	1477.20	1355.19	1395.09	4227.48	73.650
16	Bill Gordon	Pitts S-2B	N5310S	1419.79	1320.75	1423.28	4163.81	72.540
17	Darren Behm	DR-107	N23DY	1503.09	1558.89	1064.01	4125.99	71.881
18	Alain Aguayo	Pitts S-2B	N260AB	1472.17	1395.72	1215.66	4083.56	71.142
19	David Crescenzo	Pitts S-2B	N79D	1018.72	1500.86	1230.87	3750.46	65.339

Contest Director: Aaron McCartlan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Virdrine, Judges: Tim Baker, Liza Weaver, Steve Johnson, John Ostmeyer, Daniel Wisehart, Fred Weaver, Betty Stewart, Kevin Campbell (Seq 1, 2, 3 CJ), Tom Adams. Judges' Assistants: (not recorded).



**STANLEY MOYE**



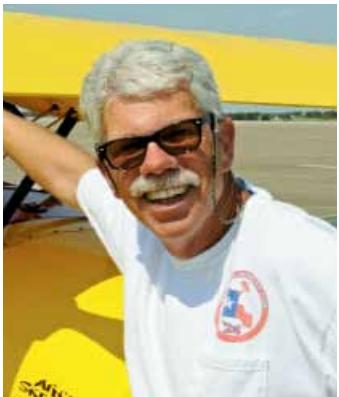
**BILL DENTON**



**DAVE SCOTT**



**F. PAUL RUSSO**



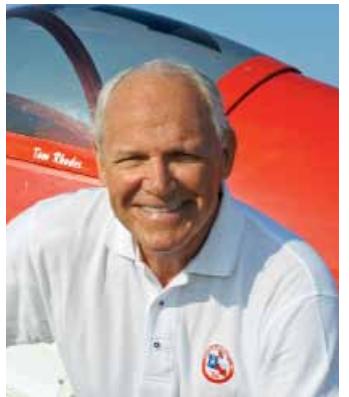
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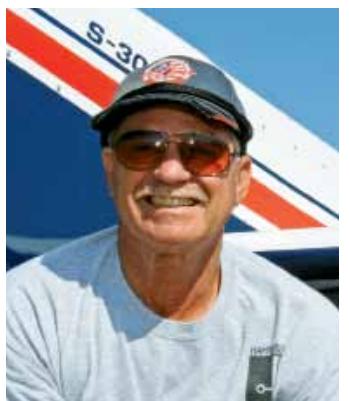
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BENJAMIN BRAZIER



JOHN SMUTNY



MIKE PLYLER



CURT RICHMOND



MATTHEW LANE



CHUCK COHEN



BILL GORDON



DARREN BEHM



ALAIN AGUAYO



DAVID CRESCENZO

## Intermediate Glider Consolidated Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	Known	Free	Unknown	Totals	O/all %
1	Mikhael Ponso	Swift	N113TX	1371.24	1221.15	1200.10	3792.48	81.559
H/C	Joshua McCray	DG-1000S	N502DG	1168.37	1038.42	1002.58	3209.37	69.019
2	James Bloch	DG-1000S	N502DG	1218.68	1063.04	831.41	3113.12	66.949
3	Aaron Gibson	DG-1000S	N502DG	1140.09	1044.60	763.46	2948.14	63.401
4	Anthony Pipe	DG-1000S	N502DG	1181.18	811.70	942.34	2935.22	63.123
H/C	Jeffery Riddlebarger	DG-1000S	N501DG	1207.96	1037.78	663.07	2908.81	62.555

Contest Director: Aaron McCartlan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Vidrine, Judges: Tim Baker, Liza Weaver, Steve Johnson, John Ostmeyer, Daniel Wisehart, Fred Weaver, Betty Stewart, Kevin Campbell (Seq 1, 2, 3 CJ), Tom Adams. Judges Assistants: (not recorded).



MIKHAEL PONSO



JOSHUA McCRAY



JAMES BLOCH



AARON GIBSON



TONY PIPE



JEFFERY RIDDLERBARGER

## Sportsman Glider Consolidated Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	Known	Free #1	Free #2	Totals	O/all %
1	Eric Stubblefield	DG-1000S	N503DG	1147.16	1154.27	1190.34	3491.77	81.966
2	Jean-Luc Duckworth	DG-1000S	N503DG	1097.49	1180.85	1211.90	3490.23	81.930
3	James Gregory	DG-1000S	N503DG	1094.20	1147.48	1170.52	3412.21	80.099
4	Edwin Kingman	DG-1000S	N503DG	1056.37	1142.48	1127.64	3326.48	78.086
5	James Nicklas	DG-1000S	N503DG	1122.96	1090.22	1103.71	3316.89	77.861

Contest Director: Aaron McCartlan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Virdrine, Judges: Tim Baker, Daniel Wisehart, Betty Stewart, Charlie Harrison, Lynne Stoltenberg, Tony Wood, Tom Rhodes, Peggy Riedinger, Julia Wood, Kurt Richmond, Marty Flournoy. Judges' Assistants: (not recorded)



ERIC STUBBLEFIELD



JEAN-LUC DUCKWORTH



JAMES GREGORY



EDWIN KINGMAN



JAMES NICKLAS



## Advanced Power Consolidated Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	Known	Free	Unknown	Totals	0/all %
1	Patrick Clark	Pitts SITM	N396PC	2143.43	2633.80	2407.42	7184.64	78.435
2	Ben Frelove	Foster Bach.	N330FB	2147.33	2328.53	2656.64	7132.50	77.866
3	Steve Johnson	MX2	N487MX	2027.71	2535.35	2507.84	7070.90	77.193
4	Marty Flournoy	Extra	N429HR	2029.47	2555.02	2450.69	7035.18	76.803
5	Andy Macha	Staudacher S300	N927GR	2006.92	2578.18	2337.14	6922.24	75.570
6	Chet Kuhn	Pitts S-1T	N991GB	2021.67	2405.47	2196.54	6623.67	72.311
7	Julia Wood	Sukhoi 26	N596TJ	1955.46	2446.29	2161.96	6563.71	71.656
8	Klayton Kirkland	Pitts S-1S	N690AB	1969.69	2134.54	2307.32	6411.55	69.995
9	Michael Forney	Pitts S-1T	N49306	2018.50	2197.96	2169.57	6386.03	69.716
10	Wayne Roberts	Extra 330LX	N330LX	2097.34	2453.35	1816.24	6366.93	69.508
11	Mark Stewart	Panzl S-330	N540ML	2075.37	2426.41	1826.28	6328.06	69.084
12	Mikhael Ponso	Pitts S-2B	N260AB	1624.32	2306.44	2388.91	6319.67	68.992
13	Bruce Ballew	Pitts S-2B	N65PS	1752.40	2402.44	2132.73	6287.56	68.642
14	Kevin Campbell	MX2	N69TK	1914.57	2154.07	2119.10	6187.74	67.552
15	Doug Sowder	Extra 300L	N25AP	2039.88	1921.23	2135.46	6096.57	66.556
16	John Ostmeyer	Pitts S-25XX	N525X	1920.84	2218.05	1950.45	6089.34	66.477

Contest Director: Aaron McCartan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Vidrine, Judges: Mike Steveson, Nick Buckenham, Klein Gilhouse, Betty Stewart, Paul Thomson, Hector Ramirez, Randy Reinhardt, Mike Gallaway, Lynne Stoltenberg (Seq 1, 2, 3 CJ). Judges Assistants: Marty Flournoy, Ben Frelove, Curt Richmond, John Smutny, Mikhael Ponso, Bruce Ballew, John Ostmeyer.



**PATRICK CLARK**



**BEN FREELOVE**



**STEVE JOHNSON**



**MARTY FLOURNOY**



ANDY MACHA



CHET KUHN



JULIA WOOD



CLAYTON KIRKLAND



MICHAEL FORNEY



WAYNE ROBERTS



MARK STEWART



MIKHAEL PONSO



BRUCE BALLEW



KEVIN CAMPBELL



DOUG SOUDER



JOHN OSTMEYER





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WHO VOLUNTEERED.

—AARON McCARTAN



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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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## Sportsman Power Consolidated Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	Known	Free #1	Free #2	Totals	0/all %
1	Paul Thomson	Decathlon	N725JM	1076.31	1156.19	1150.39	3382.90	86.741
2	Mark Killian	Pitts S-1T	N57W	1049.58	1146.23	1152.85	3348.65	85.863
3	Travis Gier	Extra 300S	N45S	1102.61	1102.69	1122.51	3327.82	85.329
4	Michael Hoy	Decathlon	N2891Z	1063.21	1104.77	1138.61	3306.59	84.784
5	Jim Doyle	Skybolt	N619PD	1076.00	1095.29	1101.63	3272.93	83.921
6	Francesco Palozzi	Christen Eagle	N72WM	1042.77	1099.50	1120.56	3262.83	83.662
7	Jeremy Humphreys	Pitts S-2B	N49LH	1092.36	1082.40	1075.10	3249.87	83.330
8	Ryan Waller	Pitts S-2B	N260AB	1009.30	1118.67	1109.02	3236.98	83.000
9	Alysha Bradford	Decathlon	N820SD	978.65	1097.30	1123.60	3199.55	82.040
10	Gina Killian	Pitts S-2A	N67PN	1006.77	1042.68	1065.03	3114.47	79.858
11	Chris Hill	Pitts S-2B	N49LH	966.37	1090.98	1043.29	3100.64	79.504
12	Aaron Fettig	Decathlon	N317JR	900.37	1063.48	1093.33	3057.19	78.389
13	Aubrey Underhill	Pitts S-2C	N44DQ	946.15	1070.23	1028.99	3045.37	78.086
14	Robbie Coats	Pitts S-2B	N260AB	927.42	1000.45	1032.55	2960.42	75.908
15	Rick Nutt	MX2	N22120	1086.11	1101.59	732.29	2919.99	74.872
16	Kenneth Mayer	Decathlon	N330MS	811.13	1062.71	993.94	2867.77	73.533
17	Jay Hanson	Am Champion	N330MS	986.67	1062.29	612.80	2661.76	68.250

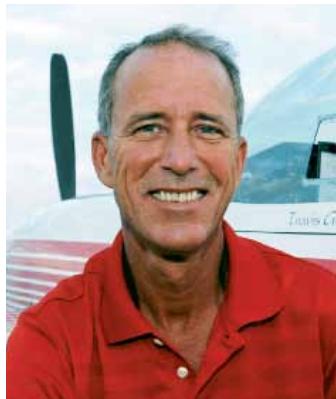
Contest Director: Aaron McCartlan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Virdine, Judges: Tim Baker, Daniel Wisehart, Betty Stewart, Charlie Harrison, Lynne Stoltenberg, Tony Wood, Tom Rhodes, Peggy Riedinger, Julia Wood, Kurt Richmond, Marty Flournoy. Judges' Assistants: (not recorded).



**PAUL THOMSON**



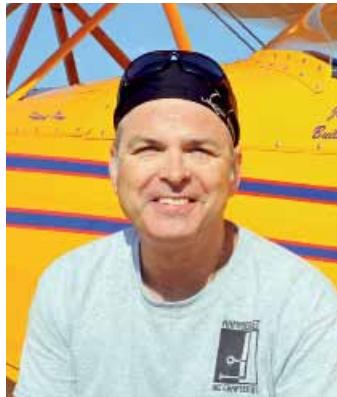
**MARK KILLIAN**



**TRAVIS GIER**



**MIKE HOY**



**JIM DOYLE**



**FRANCESCO PALOZZI**



JEREMY HUMPHREYS



RYAN WALLER



ALYSHA BRADFORD



GINA KILLIAN



CHRIS HILL



AARON FETTIG



AUBREY UNDERHILL



ROBBIE COATS



RICK NUTT



KENNETH MAYER



JAY HANSON

## Unlimited Power Team Selection Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	Known	Free	Unknown	Free Unk	Totals	0/all %
1	Rob Holland	MXS	N540JH	2820.57	3632.76	3973.87	3302.44	13729.64	78.500
2	Goody Thomas	Extra 330SC	N580BG	2786.80	3558.42	3998.89	3314.78	13658.90	78.095
3	David Martin	CAP 232	N232X	2662.34	3597.33	3766.19	3373.76	13399.62	76.613
4	Michael Racy	Sukhoi SU31	N310BW	2875.96	3525.92	3811.30	3083.91	13297.09	76.027
5	Nikolay Timofeev	MXS	N700XT	2782.92	3516.73	3770.97	3106.20	13176.82	75.339
6	Debby Rihn-Harvey	CAP 232	N232DD	2608.50	3509.43	3527.38	3249.82	12895.13	73.729
7	Robert Armstrong	CAP 231	NX3434F	2514.99	3411.42	3373.95	3591.82	12892.18	73.712
8	Melissa Pemberton	Edge 540	N540SG	2680.77	3453.55	3387.18	3234.22	12755.72	72.932
9	Hector Ramirez	Extra 300SC	N330EX	2812.64	3326.17	3226.41	3326.04	12691.26	72.563
10	Brett Hunter	MXS	N700XT	2638.41	3219.19	3579.29	3126.98	12563.87	71.835
11	Mike Ciliberti	Sukhoi 31	N131BT	2712.23	3334.45	3510.82	2763.60	12321.11	70.447
12	Dagmar Kress	Extra 300SR	N60DK	2569.45	3046.64	3165.10	2718.48	11499.66	65.750
13	Michael Gallaway	Extra 330LX	N330LX	2303.13	3095.14	3201.04	2873.37	11472.68	65.596
14	Steven Grohsmeier	Eigenhawk Solut	N7296	2478.84	3189.48	2902.56	2427.78	10998.66	62.885
15	Francis Barros	Sukhoi 31	N131BT	2535.43	3201.38	3393.00		9129.81	52.200
16	Tony Wood	Sukhoi 26	N596TJ	2466.35	2941.57	3500.37		8908.28	50.934
17	Larry Connor	MXS	N700XT	2194.78	2953.85	2728.86		7877.49	45.040

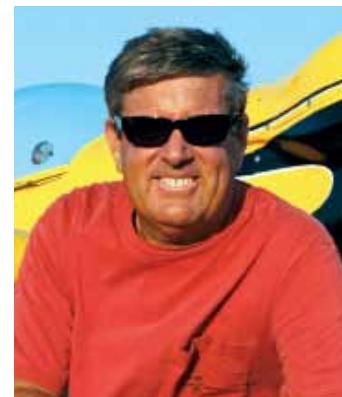
Contest Director: Aaron McCartan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Vidrine, Judges: Chris Rudd, Mike Steveson, Wayne Roberts, Doug Sowder, Mark Matticola, Bill Denton, Mike Forney, Charlie Harrison. Judges' Assistants: Marty Flournoy, Ben Freelove, Curt Richmond, John Smutny, Mikhael Ponso, Bruce Ballew, John Ostmeyer.



**ROB HOLLAND**



**GOODY THOMAS**



**DAVID MARTIN**



**MICHAEL RACY**



**NIKOLAY TIMOFEEV**



**DEBBY RIHN-HARVEY**



ROBERT ARMSTRONG



MELISSA PEMBERTON



HECTOR RAMIREZ



BRETT HUNTER



MIKE CILIBERTI



DAGMAR KRESS



MICHAEL GALLAWAY



STEVEN GROHSMAYER



FRANCIS BARROS



TONY WOOD



LARRY CONNOR

## Unlimited Power Consolidated Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	Known	Free	Unknown	Totals	0/all %
1	Rob Holland	MXS	N540JH	2820.57	3632.76	3973.87	10427.19	80.395
2	Goody Thomas	Extra 330SC	N580BG	2786.80	3558.42	3998.89	10344.12	79.754
3	Michael Racy	Sukhoi SU31	N310BW	2875.96	3525.92	3811.30	10213.18	78.745
4	Nikolay Timofeev	MXS	N700XT	2782.92	3516.73	3770.97	10070.62	77.645
5	David Martin	CAP 232	N232X	2662.34	3597.33	3766.19	10025.86	77.300
6	Debby Rihn-Harvey	CAP 232	N232DD	2608.50	3509.43	3527.38	9645.31	74.366
7	Mike Ciliberti	Sukhoi 31	N131BT	2712.23	3334.45	3510.82	9557.50	73.689
8	Melissa Pemberton	Edge 540	N540SG	2680.77	3453.55	3387.18	9521.50	73.412
9	Brett Hunter	MXS	N700XT	2638.41	3219.19	3579.29	9436.89	72.759
10	Hector Ramirez	Extra 300SC	N330EX	2812.64	3326.17	3226.41	9365.22	72.207
11	Robert Armstrong	CAP 231	NX3434F	2514.99	3411.42	3373.95	9300.36	71.707
12	Francis Barros	Sukhoi 31	N131BT	2535.43	3201.38	3393.00	9129.81	70.392
13	Tony Wood	Sukhoi 26	N596TJ	2466.35	2941.57	3500.37	8908.28	68.684
14	Dagmar Kress	Extra 300SR	N60DK	2569.45	3046.64	3165.10	8781.19	67.704
15	Michael Gallaway	Extra 330LX	N330LX	2303.13	3095.14	3201.04	8599.31	66.302
16	Steven Grohsmeier	Eigenhawk Solut	N7296	2478.84	3189.48	2902.56	8570.88	66.082
17	Larry Connor	MXS	N700XT	2194.78	2953.85	2728.86	7877.49	60.736

Contest Director: Aaron McCartan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Virdrine, Judges: Chris Rudd, Mike Steveson, Wayne Roberts, Doug Sowder, Mark Matticola, Bill Denton, Mike Forney, Charlie Harrison. Judges Assistants: Marty Flournoy, Ben Freelove, Curt Richmond, John Smutny, Mikhael Ponzo, Bruce Ballew, John Ostmeyer.



**ROB HOLLAND**



**GOODY THOMAS**



**MICHAEL RACY**



**NIKOLAY TIMOFEEV**



**DAVID MARTIN**



**DEBBY RIHN-HARVEY**



MIKE CILIBERTI



MELISSA PEMBERTON



BRETT HUNTER



HECTOR RAMIREZ



ROBERT ARMSTRONG



FRANCIS BARROS



TONY WOOD



DAGMAR KRESS



MICHAEL GALLAWAY



STEVEN GROHSMAYER



JAY HANSON

## Advanced Glider Consolidated Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	Known	Free	Unknown	Totals	O/all %
1	Lukas von Atzigen	SZD 59	N59SZ	1401.28	1455.13	1308.24	4164.65	78.430
H/C	Mark Matticola	DG 1000S	N501DG	1258.98	1114.79	1327.76	3701.53	69.709
2	Connor Deebel	DG 1000S	N501DG	1284.41	1219.46	1177.36	3681.23	69.326
3	Nicholas Dona	DG 1000S	N501DG	1058.86	1350.27	1242.44	3651.57	68.768
4	Christopher Villanueva	DG 1000S	N501DG	1079.23	1350.86	1149.30	3579.39	67.408

Contest Director: Aaron McCartan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Vidrine, Judges: Nick Buckenham, Klein Gilhouse, Betty Stewart, Paul Thomson, Hector Ramirez, Randy Reinhardt, Mike Gallaway, Lynne Stoltzenberg (Seq 1, 2, 3 CJ). Judges' Assistants: Marty Flournoy, Ben Frelove, Curt Richmond, John Smutny, Mikhael Ponso, Bruce Ballew, John Ostmeyer.



LUKAS VON ATZIGEN



MARK MATTICOLA



CONNOR DEEBEL



NICK DONA



CHRIS VILLANUEVA

## 4-Minute Freestyle Results

Ranked by scores

Rank	Pilot	Aeroplane	Registration	4m Free	Totals	O/all %
1	Rob Holland	MXS	N540JH	3789.52	3789.52	94.738
2	Debby Rihn-Harvey	CAP 232	N232DD	3457.62	3457.62	86.440
3	Paul Jennings	Swift S-1	N114EW	3300.00	3300.00	82.500
4	Robert Armstrong	CAP 231	NX3434F	3146.78	3146.78	78.670
5	Francis Barros	Sukhoi 31	N131BT	2914.85	2914.85	72.871

Contest Director: Aaron McCartan, Contest Chief Judge: Charlie Harrison, Scoring Director: Stephanie Vidrine, Judges: Chris Rudd, Mike Steveson, Wayne Roberts, Doug Sowder, Mark Matticola, Bill Denton, Mike Forney, Charlie Harrison. Judges' Assistants: Marty Flournoy, Ben Freelove, Curt Richmond, John Smutny, Mikhael Ponso, Bruce Ballew, John Ostmeyer.



**ROB HOLLAND**



**DEBBY RIHN-HARVEY**



**PAUL JENNINGS**



**ROBERT ARMSTRONG**



**FRANCIS BARROS**

# The Best of the Best

BY NORM DEWITT  
PRESIDENT, UNLIMITED AEROBATICS USA INC.

At this year's U.S. National Aerobic Championships held at the North Texas Regional Airport (GYI), 16 Unlimited pilots signed the pilot declaration forms indicating their desire to compete for a coveted spot on the U.S. Unlimited Aerobatic Team. The top five males and top five females scoring 70 percent or better earn a position. If there are fewer than five of one gender, then CIVA rules allow six team members of one gender and four of the other. Since only two females earned positions, there will be six males to make up the team. All 16 pilots were talented enough to be selected if they executed their flights with no zeros and no outs. But at the Nationals, the weather, the winds, zeros, outs, and pressure soon separate the competitors. It is the same at the World Aerobic Championships.

Your new Unlimited team members are Robert Armstrong, Rob Holland, David Martin, Melissa Pemberton, Debby Rihn-Harvey, Goody Thomas, and Nikolay Timofeev. Hector Ramirez is the alternate. This is a very strong and experienced set of team members. All of them have competed in prior world championships. Mike Steveson

has been selected as the team manager. Rob Holland is this year's national champion for a second time, and he was a gold medal winner in the 4-Minute Freestyle at the last World Aerobic Championships (WAC).

The next WAC will be held in October 2013 in Sherman/Denison, Texas. Our team members are now embarking on a journey that will culminate at the awards banquet at WAC 2013. The men will focus on winning the Nesterov Trophy for the highest-scoring men's team. Debby and Melissa have their sights set on winning the FAI Challenge Cup for the highest-scoring women's team. All will have to work together to win the gold.

Unlimited Aerobatics USA is a charitable corporation actively seeking individual contributions and corporate sponsorship for the Unlimited team. Donations for the team may be made through PayPal on this website or mailed to: Unlimited Aerobatics USA, 148 Magnolia Dr., Atherton, CA 94027. Thank you for your support, and we look forward to keeping you informed about your Unlimited team throughout the year.

IAC

# WELCOME



The team is looking for interested corporate sponsors and seeking individual tax deductible donations. Send donations to Unlimited Aerobatics USA, Inc., 148 Magnolia Drive, Atherton, CA 94027 or visit the team website at [www.unlimitedaerobaticsusa.com](http://www.unlimitedaerobaticsusa.com). For more information, contact Norm DeWitt, President, Unlimited Aerobatics USA at 650-321-8499.

Back row, L to R: Hector Ramirez (alternate), Goody Thomas, Rob Holland, Mike Steveson (Team Manager), David Martin, and Robert Armstrong  
Front row, L to R: Michael Racy, Melissa Pemberton, Debby Rihn-Harvey, and Nikolay Timofeev



LAURIE ZALESKI PHOTOS

# TEAM 2013

# TECH TIPS

## 'HOW TO FLY' SERIES, THE LOMCOVAK

BY SAM BURGESS

REPRINTED FROM THE INTERNATIONAL AEROBATICS CLUB  
TECH TIPS MANUAL, VOLUME IV

To set the record straight on the history of the Lomcovak, I called Joe Krybus of Santa Paula, California, a Czechoslovakian who emigrated to the USA and who used to fly Bükers in his native country. Joe runs a Bücker over-haul facility, sells plans and hosts a Bücker fly-in every year.

Over the years several descriptive and often disparaging epithets have been hung on the Lomcovak such as, "real crazy, drunken bum, headache, etc." But it really alludes to the Slivovic (a stiff, alcoholic, strong vodka drink) which is chug-a-lugged straight. After just one you fall off the bar stool, look up and proclaim, "I just did a Lomcovak."

The very first time I did a Lomcovak in aerobatics was strictly by accident. Some years ago an Unlimited Known sequence was published with an up 45-degree, half-outside snap roll. As most everyone had some idea of how a Lomcovak was started this certainly looked like one. I inquired of one of the more experienced aficionados and he curtly replied, "No, it isn't," and walked away. So, I planned to stop it by just nudging the controls. But according to the critiquers on the ground, I just fell off the bar stool. I didn't find out until later that LEFT rudder will keep it from Lomcovaking (propeller rotation being a factor).

The late Neil Williams, in his book, *AEROBATICS*, had a very good chapter on this maneuver describing at least five basic Lomcovaks, but this article will dwell only the main Lomcovak for the more advanced aerobatic pilot trying one for the first time. Keep in mind that your aircraft must be fully aerobatic and stressed for Unlimited type

figures as this maneuver probably imposes more unusual load factors on your ship's airframe, control surfaces, engine mount and propeller flange and pilot than any other figure. Also, do not attempt this figure unless your aircraft is well within the weight and balance limits. A course in flat spin recoveries wouldn't hurt either.

Okay. To get it started is the easiest part — oddly enough. It is really an over-rated maneuver when considering the difficulty factors and it is not to be found in the Aresti manual because it is considered an "out of control maneuver." Pull up positive to at least a 60-degree line with full throttle. Anything less than this angle and the speed will not dissipate fast enough during the Lomcovak to insure no damage to your aircraft and will result in a more violent entry. When you reach the recommended speed for your aircraft for an outside snap roll (Pitts SIS, 110 MPH), apply full right rudder and full forward stick with full left aileron (propeller rotation clockwise from the cockpit).

You will explode in an exhilarating, tumbling, wheeling, complete reversal while rotating around all three axes at the same time. You will be provided with a kaleidoscope of the ground, sky and horizon not experienced in any maneuver you have ever tried before. Although your trajectory will probably realize recovery at or above your starting altitude, be sure to practice this somewhat strange figure at a safe altitude.

Immediately after it breaks, neutralize the controls to prevent any loading of the surfaces in the fully deflected position. It is most important to neutralize the rud-

der to prevent recovering in a spin.

This is probably the only aerobatic maneuver where the propeller can be used as an aerodynamic control. It is recommended to retard the throttle after the first rotation. Metal propellers are particularly stressful on prop flanges compared to the flexing of wooden propellers. Additionally, throttling down will slow the pitch rate for a recovery that is not always completely predictable in terms of aircraft position when the gyrating stops.

To reiterate, to make the maneuver as safe as possible, there are four items to keep in mind — at least a 60-degree upline, low entry speed, neutralizing the controls and closing the throttle soon after entry.

Your initial negative G environment, while sitting near the center of gravity, will change to almost zero G and can cause some feeling of disorientation. Almost as important as your entry technique is the CG of your aircraft. Pitts Special N3333N with six gallons of fuel would enter nicely and recover with complete control. At the top of the arc and almost out of speed you could hit it again and it would do a second Lomcovak on the back side of the trajectory. For 15 minutes after landing it feels like you are still doing one.

The long wing Zlins, Yaks, Stephens Akros, and other aircraft of considerable span are actually more graceful and gentle as they can be controlled through the main, cap and conic Lomcovaks while the little Pitts are more spectacular. Max Shauck and myself had a dual routine with a series of head-on passes culminating in two Lomcovaks as we passed. It was a real crowd

pleaser. You will see them in many Unlimited 4-Minute Freestyles as the starting or finishing figure. It is indeed a maneuver that will get the judges' attention with high marks in execution.

So, have at it. Read Neil Williams' book. Learn to pronounce Lomcovak. Record it on video. Get at least 5,000 feet. Follow the above entry and recovery steps. Check that prop flange. And you will have performed a new maneuver that probably will be the highlight of your aerobatic career.

But first, go to your favorite bar, order up a Slivovic and practice falling off that bar stool!

**EDITOR'S NOTE:** *One might consider reading Eric Midler's comments on the Lomcovak, too, on pages 138 and 139 in his book, FLIGHT UNLIMITED, particularly his notation about the ending of this maneuver in an inverted spin. Since one might end up as Midler suggests rather than avoiding a spin as Burgess suggests, one might also seriously consider taking an emergency spin recovery course, such as that developed by Gene Beggs, before attempting this maneuver.*

IAC

## NEWS BRIEFS



### Proposed Rule Changes Posted

The proposed rule changes for 2013 are posted on the EAA's Unusual Attitudes Forum - visit <http://tinyurl.com/8kknjde> to view them. If you would like to comment on any of the proposals, you will need to register and log in on the EAA Forums site. The Unusual Attitudes Forum will be the ONLY place for members to make official comment on these proposed rules and knowns. The comment deadline is Nov. 11, 2012.

IAC

## CONTEST CALENDAR

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

### Tequila Cup (Southwest)

Friday, November 9-Saturday, November 10, 2012

Practice/Registration: Thursday, November 8

Gliders Categories: Sportsman

Power: Primary through Unlimited

Location: Marana Northwest Regional Airport (AVQ), Marana, AZ

Region: Southwest

Contest Director: Jim Ward

Contact Information: Primary Phone: 603-860-4456

E-Mail: [james.roger.ward@gmail.com](mailto:james.roger.ward@gmail.com)

Website: [www.tequilacup.org](http://www.tequilacup.org)

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# TECH TIPS

## SLOW ROLL

BY JIM BATTERMAN  
IAC #2608

REPRINTED FROM THE INTERNATIONAL AEROBATICS CLUB  
TECH TIPS MANUAL, VOLUME IV

The slow roll is defined as a precision figure with a constant rate of roll while maintaining heading and altitude. This roll is probably one of the more frustrating figures for the novice aerobatic pilot to learn to do well. It is important to learn and fly it well with accuracy because it not only stands alone in competition but portions of the slow roll appear in many other figures such as the Immelmann and Cuban eight.

In this article we will attempt to explain not only proper control inputs to accomplish the slow roll but we'll also talk about the common slow roll errors and their cause and correction. Our aircraft for this discussion will be a Bellanca Decathlon and all comments will relate to performance of the slow roll in that aircraft. The ailerons are the dominating control during this figure while the elevator and rudder will be used as trim controls to maintain heading and altitude. Our roll will be to the left and entry speed will be 120 MPH along a level line. A slight pitch up of about five degrees will be needed prior to rolling to avoid a loss of altitude on entry.

Aileron is applied to the left for rolling and we use left rudder to overcome the effects of adverse aileron yaw and maintain the heading. As the airplane rolls about 40° it will want to start turning left; so we need to switch feet and use the right rudder to counter the

turn. At about 70° of roll, more pressure with the right foot will be needed to help keep the nose from falling. At 90° of roll or the first knife edge position, forward elevator will be needed to hold heading while continuing to maintain right rudder pressure. A common error by many when applying the forward pressure at the knife edge is to relax aileron pressure which will decrease the roll rate.

As the airplane continues to roll toward inverted, the right rudder is maintained and forward pressure is increased to hold altitude. When reaching inverted the stick will be to the left and will have reached the most forward elevator position during the roll. You will still be maintaining rudder pressure on the right pedal. As the aircraft passes inverted by 20°, pressure is again applied to the left pedal. A common error at this point is to also relax forward pressure on the stick, causing the nose to drop.

As we reach the 270° point of the roll or the second knife edge, back pressure on the stick must be applied to maintain heading. Once past the 270° point in the roll, pressure on the left pedal and back pressure on the stick are gradually increased to maintain heading and altitude while continuing to hold full left aileron to maintain the rate of roll. At 360° of roll, controls will be centered and a level line will be flown completing

the figure.

We have now explained the basic control inputs to fly the slow roll. Now let's look at the cause of some common errors in the slow roll and where they occur.

Error (1) — Rate of roll not constant — The most common error here is to relax aileron pressure when forward pressure on the stick is applied 90° to 180° of roll, knife edge to inverted, and 270° to 360° of roll, second knife edge to upright.

Error (2) — Altitude higher at completion than entry — This is not a common problem but it is caused by raising the nose too high at entry, excessive right rudder pressure 70° to 90° into roll, and excessive forward pressure at the inverted position.

Error (3) — Altitude lower on completion than entry — This is a very common problem caused by a good number of errors: first, not raising nose prior to roll entry; second, excessive left rudder pressure on entry; third, not changing to right rudder at the 40° position in the roll and not increasing that rudder pressure from 70° to 90° of roll; fourth, not applying forward pressure on stick at knife edge and increasing forward pressure to inverted; fifth, maintaining right rudder pressure beyond the 20° past inverted position; sixth, when left rudder is correctly applied at the 20° past inverted position a common mis-

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take is to simultaneously apply back pressure on the stick (Back pressure should not occur until 270° of roll); seventh and last, not increasing left rudder pressure and back pressure at a constant rate from the 270° to the completion of the roll.

Error (4) — Off heading to the right at completion of roll — This is caused by literally starting off on the wrong foot. The roll entry requires, left rudder then right. Some people will lead with the right foot. A second cause is adding right rudder at the correct time but to an excessive degree; third cause, adding forward pressure on the stick too soon in the roll. This normally happens when changing from left rudder to the right foot. Forward pressure on the stick should occur at 90° of roll. A fourth cause is using excessive forward pressure at 90° of roll and also relaxing aileron pressure which slows the rate of roll and allows heading to change.

A fifth cause is not maintaining right rudder pressure through the inverted position. A sixth cause is application of left rudder at proper position at 20° past inverted but to an excessive degree. A seventh cause is application of back pressure on the stick too soon (that should happen at 270° of roll), also excessive back pressure at the correct point, as well

as relaxing aileron pressure. Slowing roll rate will cause loss of heading to the right.

A final cause is not increasing left rudder pressure while completing the last 45° of roll.

Error (5) — Off heading to the left at completion of roll — This is caused by early or excessive application of left rudder at entry; second cause, not using the right rudder at the 40° point in the roll; third, not adding forward pressure on the stick at 90° of roll or increasing the forward pressure as aircraft approaches inverted; fourth, continuing forward pressure past the inverted position; fifth, not changing to the left foot at 20° past inverted; sixth, not adding back pressure on the stick at 270° of roll; and finally, excessive left rudder during the last 45° of roll will cause heading to be off to left on completing.

Error (6) — Barrelling the slow roll — This is caused by all of the above or by proper timing and sequence of control inputs but using excessive amounts of rudder and elevator to a proportionate degree throughout the roll.

As you can see there are a lot of possible errors and combinations of errors that occur while practicing the slow roll. That's what makes it a tough figure for an instructor to teach and the student to learn. Each attempt usually turns up a new problem to work on. **IAC**



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