



Northern California
Aerobatic Club

CHAPTER 38

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THE ACRONAUT

Volume 9 - Number 5



3-D R/C Flying at New J

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Chapter Membership Dues

Just a reminder that your Chapter 38 dues for 2008 are NOW PAYABLE.

To simplify bookkeeping, we levy Chapter dues on a calendar year basis (Jan 1 – Dec 31).

Use the form on the last page of the Newsletter, or go to the Website and you can link to PayPal. Please provide/update all the requested information.

Just \$25/year, or \$30 for a family, to renew (or join) – and continue to enjoy the many benefits of Chapter membership (including practice box usage).

President's Post

Darren Pleasance



T-minus one month until Paso...

I hope you've all got **June 5-8** blocked off for our annual aerobatic extravaganza in Paso Robles. Whether you intend to compete or not, you should absolutely attend the contest and participate in whatever way you can. We're always in need of volunteers and the event itself should be a great time as it has been each and every year. Tom Myers has done a terrific job getting us ready for the contest once again. As in prior years, if you are able to come down on Wednesday to help set up the airport and the box, your help would be greatly appreciated. Our chapter has invested in new box markers that will make box set up and teardown much faster this year, so please come down to help and partake in the fun.



On other fronts, we had an amazing 3-D RC Model demonstration last month out at the New J airport. I had completely underestimated how impressive this demonstration would be. Zak and Greg, our two demonstration pilots, put on one heck of a show with a 1/3 scale Sukhoi and Extra, as well as

with an electric aerobatic helicopter. For those who haven't seen the video of Zak's flight on our website, you should definitely take a moment to watch it. Many thanks to Brett Goldsmith for organizing the whole event!

At last month's chapter meeting we also had a great discussion, led by Andrew, about the options for aerobatic helmets,



Can you do that in a Pitts?

ranging from the \$1,000+ Gentex helmet available from Flight Suits, to home-made helmets for a couple of hundred dollars. We had on display at the Chapter meeting really good examples of each of these types of helmets so feel free to reach out to me or Andrew if you want to learn more about what we discussed.

And finally, last month several of our members made it up to the Calaveras Country airport day, much to the delight of Kathy, the airport manager. Many thanks to Dave, Howard, and the others who were able to make it up there. It goes a long way to preserving the goodwill of the airport and local community.

Well, that's about all for now. I'll look forward to seeing you all at the next Chapter meeting this coming **Sunday, May 11th at 4:00 p.m.** as well as the upcoming critique sessions in prep for Paso.

Blue skies,

Darren

Pitts Fabric Failure

by Dave Watson

pictures by Peter Jensen

In the past I've written of my aircraft mechanical failures in an attempt to bring better attention to the pitfalls that I unfortunately befell. In 2003, I created numerous failures in the wings of my Decathlon from doing snaps while competing with it in Intermediate. In Feb 2008, I reported on the wrist pin failure that I had in my AEIO-360 (also in the Decathlon). So those familiar with my name and seeing it on the technical advisor again, you may be asking yourself, what has Dave done to his plane now?

Well to make a long story short, I pulled the wings off another plane and, once again, the problem that got me could get you too. The failure is from ignorance not from abuse. The lessons learned are more from the story of the events leading up to the failure rather than in the failure itself. Here's the details.

I purchased a beautiful 1989 S2-B in Dec 2006, the previous owner was a good friend and I knew the plane well (so I assumed). I agreed to buy the plane over the phone having not seen it for over two years (I had moved to the west coast and the plane was back in New England). The previous annual had been conducted by another friend of mine and if it looked good to them it was good for me. The one proviso my mechanic friend gave me was that he did not have a punch tester to check the fabric, but it had been tested and was OK just a few years prior. Having seen this plane numerous times, I blew off the fabric test as it was visually in perfect condition. Big mistake Numero Uno!

The plane then spent the majority of the next year hangered in Massachusetts (to avoid California sales taxation) and I flew one contest with it in New England that year. After its obligatory 365 days outside of CA airspace, it arrived in CA in perfect condition; the fabric and paint still looking like the "hanger queen" that she had been for the past five years.

Within the first three months, I flew her in Advanced at two contests. It was at the second contest where my series of mistakes, added up to an eye opening event.

I had just finished the Advanced Unknown that started with an inverted 90 degree turn into a push to hammer with a $\frac{3}{4}$ roll up. As it was a hot summer day in CA, I knew I would need all the smash I could muster from my biplane to get cleanly through that vertical roll. I stormed into the box at Vne, quickly rolled inverted, performed 3 quick wags, rolled to 75 degrees and smashed the stick forward, rolled out,

counted to two and once again smashed the stick forward for the push hammer, I was half way through the vertical roll when my lights went dim.

Although I didn't exceed the planes negative G rating, I did bring on those G's violently, not smoothly. Although the inverted turn scored fantastically, this was Big Mistake #2. I finished the sequence, landed and quickly readied myself and the plane for a friend's impending Intermediate Unknown (I was required an insurance/safety pilot for his flight in my plane).

After a cursory (big mistake #3) pre-flight check, we jumped in and it was his turn in the box. During his second maneuver, an Immelman, I thought I caught a glimpse of blue and yellow out of the corner of my eye just as he rolled from inverted to upright at the top of the half loop. I quickly

started scanning the plane for evidence of anything wrong. As my friend continued through his sequence, I continued to scan the plane and the volume of the air within the box for anything to confirm what I thought I saw. I never did see anything wrong with the plane and never saw the flash of color again. Since my buddy was zipping through the sequence as if nothing was wrong, I assumed we had shed one of the little round inspection plates during his pull into the Immelman. Stupid mistake #4.

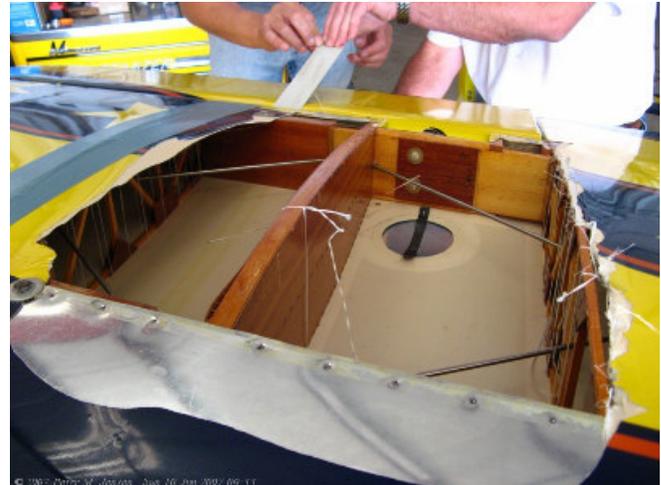
After he finished flying the sequence, I broke radio silence and told him "we needed to look the plane over after we land, I think we lost an inspection cover". The inspection didn't take long, as soon as the canopy opened and I stood to get out, my heart stopped. Two rib bays worth of fabric from the leading edge to the aileron was missing from the top of the top wing. How could this plane still fly, never the less complete at least seven Intermediate figures (without a noticeable change in flight characteristics) in this condition? You can only imagine the attention we got on the ramp.

After not-so-close inspection by a highly experienced fabric repairman, I was told my plane was covered in cotton. "COTTON! What the Hell, how that be?"

Here's where the story really starts. Turns out, previously unbeknownst to me, Christen Industries covered many planes in the late 80's with cotton; presumably because they were having difficulties getting good adhesions and laminations with



This finish looks pretty nice to me...



Still flew Intermediate just fine...

the polyester. So for many planes they reverted to good old 20's technology - cotton. After acquisition of Christen Industries, Aviat determined this and contacted all the owners of those planes and offered a low cost recovering in polyester at the factory (unfortunately this offer expired in the early 90's). Few owners took them up on the offer and many continued to fly with the cotton, probably assuming they wouldn't own the plane in 20 years anyway so why fix what ain't broken?

After the incident, I carefully went through the logs and service records and I could not find the word cotton anywhere. Once again, it's the little things that add up. The first entry in my aircraft log is that these are "replacement logs - the originals were stolen". Perhaps the original logs mentioned cotton, but even if they had, I still would have purchased the plane.

The amazing thing is that this cotton bird did not have a single crack, scratch or otherwise imperfection in the fabric. The aluminum side panels had oxidized more heavily and looked worse than the fabric; so how could there be anything wrong? A bad assumption of mine is that I could judge this book by her cover. Not so, as I have now found out, the dope actually adheres and ages better on cotton than it does on polyester. But, as it turns out, the cotton under the paint is free to degrade like that old Greatful Dead tee shirt in your closet.

After considering all my options, the plane was taken to the factory and the remaining fabric tested out at 25 pounds punch force. Well below *half* the minimum allowable. The plane is now fully restored and once again looks factory new. My learning points from this experience:

* Don't take your good-looking fabric for granted. Even polyester can fail when subjected to the forces we apply to it when we do extreme maneuvers. Do your fabric tests as required/recommended (more often as your plane ages).

* Duct tape is amazing stuff!

* Although the time considerations of contests my rush you during pre-flight preparations, don't rush it. I am certain that I must have initiated some failure of the fabric in my Advanced routine, but because I didn't have time to grab a ladder and check the top of the wing closely, I'll never really know. I do know that the Emmelman was not what caused that fabric to fail.

* If you think something is wrong, it probably is. I know I saw something falling to the ground, so why did I assume the best when lives were at stake?

* If you are on a judging line and you see a piece of a plane come off, please mention it to the chief judge (one of the boundary judges later mentioned that they saw something falling to the ground). My buddy had taken a break in his routine, if the Chief Judge had mentioned they saw something, it would have tipped me to land to plane immediately.

* Duct tape is amazing stuff!





Dean Hickman-Smith and Dave Watson with their newly covered S2-B

* Most importantly, if you have an originally covered late 80's Christen Industries aircraft, check your logs and/or look at the back of your fabric. If it's yellow and smells funny (like that Greatful Dead tee that you're afraid to wash for fear it will fall apart), it's cotton. Aviat is fairly certain that mine was *not* the last of the flying Christen cotton birds of the 80's. If you have cotton coverings, have them tested immediately and be prepared for substantial recovering bills. The cotton under that beautiful paint/dope is probably long past its life expectancy.

In closing, I can't thank Danny Adams at Aviat enough for the sensational service and spectacular recovering job they performed on the plane. Fly Safely.

- Dave

Motor cut. Forced landing. Hit cow. Cow died. Scared me.

— Dean Smith, telegraph to his chief, quoted by Amelia Earhart, 'The Fun of It,' 1932.

Press Release



Spencer Suderman

Torgoen Swiss, a fast growing manufacturer of wristwatches for aviators and aviation lifestyle enthusiasts today announced it is launching the Torgoen Academy of Flight Safety in partnership with Air Show Pilot Spencer Suderman and his Be-A-Safe-Pilot training program. The academy's curriculum will deliver specialized flight training to both private and commercial pilots that will increase aviation safety by teaching pilots essential recovery and survival skills not normally offered in either primary or advanced flight training.

"The Torgoen Academy's training teaches pilots to be safer by teaching them to deal with departures from normal flight, upsets due to turbulence and mechanical failures by maintaining a cool head and applying techniques learned in the school's aerobatic training aircraft to resolve the situation at hand. "We literally turn pilots' upside-down in real airplanes in order to give them the confidence to fix the problem without the panic," said Spencer Suderman, chief flight instructor and air show pilot. "Expanding the relationship as Torgoen's brand ambassador and re-naming the training program will help spread the word throughout the aviation industry that only through proper training and experience will all pilots become safer pilots."

The Torgoen Academy is based at the Camarillo Airport in Ventura County, California and operates year round taking full advantage of the predominantly excellent weather in the southwestern United States. It is the only flight school in Southern California flying the Pitts Special S-2B high performance biplane.

For more information about the Torgoen Academy of Flight Safety, visit <http://www.torgoenacademy.com>



I came to admire this machine which could lift virtually any load strapped to its back and carry it anywhere in any weather, safely and dependably. The C-47 groaned, it protested, it rattled, it leaked oil, it ran hot, it ran cold, it ran rough, it staggered along on hot days and scared you half to death, its wings flexed and twisted in a horrifying manner, it sank back to earth with a great sigh of relief - but it flew and it flew and it flew.

Hiller Aviation Museum's fabulously restored DC-3 flew in to Half Moon Bay and arrived with a very nice wheel landing.

— Len Morgan. The C-47 was the U.S. military designation for the DC-3.



P-51 Mustang, "Straw Boss II," taken by Peter J. Mancus at Half Moon Bay
www.cloud9photography.us

From the Editor

Che Barnes

Greetings! Summer is arriving and the days are getting long—no excuses to not get out and enjoy some air shows, fly-ins, and flying.

Special thanks to Dave Watson for sending in a great article on his fabric failure experience. He has been a stalwart contributor to the newsletter and it is much appreciated. Also, Spencer sent in a tidbit from his air show operation—looks like he found a good sponsor and from what I hear they are hard to come by. Best of luck, Spencer. Vicki Cruse hooked me up with the box entry article by Doug Sowder of Chapter 67 and I figured now is a good time to read up on it.

I was unable to attend the RC demo at New J last weekend because I had to go to Half Moon Bay for a fly-in. Tough duty. We flew a C-130 in for the Coast Guard. We ended up taxiing by our parking spot, so the aircraft commander had the load master open up the back cargo ramp to ensure clearance, then he put the engines in reverse (beta) and backed up to make the turn. I was impressed, and I am sure all the people at the 30 Café about 100 feet away were as well. Not a usual sight to see during breakfast.

The deal included a free dinner and hotel. The Dream Machine fly-in is an annual event there, and includes static displays of a large amount of aircraft as well as a car show. A temporary tower was up and lots of folks flew in. There were several airplanes giving rides, and Attitude Aviation's Pitts S-2C was doing a great job representing aerobatic. There were lots of warbird fly-bys as well. All around, not a bad weekend for airplane people.

As I write, it is the first day of the IAC Apple Valley contest, so I am a little bummed about missing that. As Darren mentions, Paso Robles contest is right around the corner.

I hope everyone is enjoying the spring and don't forget to take some pictures of any aviation exploits you engage in and send them to Peter and I for the newsletter.

Fly safe,

- Che



North America T-28 Trojan. The T-28 Trojan was a piston-engined military trainer aircraft used by the United States Armed Forces in the 1950s and into the early 1980s. The largest single concentration of this aircraft was employed by the U.S. Navy at NAS Whiting Field in Milton, Florida in the training of student naval aviators. The last U.S. Navy training squadron to fly the T-28 was VT-27, based at NAS Corpus Christi, Texas, flying the last T-28 training flight in early 1984. Many T-28s were subsequently sold to private civil operators, and due to their reasonable operating costs are often found flying as warbirds today.



Half Moon Bay's "Super Tug" above. Below, airshow great Eddie Andreini's "Super Stearman"



Entering the Box with Style

by Doug Sowder, IAC Chapter 67

Original published in Chapter 67's June 2001 Newsletter

Sent in by Vicki Cruse

Unless you had the foresight to pick up the breakfast tab on Contest Day, your first opportunity to favorably impress your category's judges may come when you enter the box for your first flight. It goes without saying that, if you climbed in the box, you maintained a constant climb rate, climbed on the X and Y axes and did wind circles, rather than just wandering aimlessly. If you did your safety roll within sight of the judges, it was clean, on point, and on heading - right? What would a judge's expectations for the upcoming flight be if the safety roll was sloppy?

So what comes next? Your box entry serves several purposes. It lets the judges know that you're about to entertain them. It places you in the box at the Y-axis location that you need, considering crosswinds and any upcoming cross box figures. And, it places you on the X-axis at the pull point, altitude, and airspeed that you've pre-determined for this flight. You could line up for a 5-mile final to the box and cruise on in. The judges might notice you, or they might not. Alternatively, you could fly a base leg just downwind of the box, parallel to the Y-axis (assuming upwind entry). When you reach your pre-determined Y-axis position, turn into the box, fly a short final, wing wag, and begin.

Usually, the first figure in a sequence starts with a pull to vertical, to 45 degrees, or a loop of some sort. You'll need speed. If you fly your base leg at high speed, timing the turn-in becomes critical and difficult.

So how about this: fly base fairly slowly and at an altitude well above your planned starting altitude. If you have a constant speed propeller, keep RPM at low cruise until a few seconds before you turn onto final, then increase to competition RPM. Keeping in mind the few seconds that sound takes to reach the judges, they'll hear you just about the time you turn in. They'll start yelling "heads up" and running back from the Honey Bucket.

If you fly base with a wing down about 30 degrees toward the box, the entire box will be laid out for you. Reaching your chosen Y-axis position, kick rudder toward the box, the bank will instantly steepen, the nose will automatically drop to a good dive angle, and you'll roll out on the X-axis right where you want to be.

So what's a good dive angle for your entry? You don't have to dive at full power, so how about 45 degrees? This is the angle that judges are accustomed to seeing for other figures, and it's fairly easy to calculate distances, since the vertical and horizontal legs are the same. Calculate distances?? More in a minute.

How about those wing wags? They aren't graded figures, but make them look sharp. What angle of wag? Well, how about 90 degrees? Actually, anything over 45 degrees looks pretty good, but try to make them all the same. Adding a hesitation adds punch to the wing wag. If you're flying a slowly roller, the wagging time is limited. Keep track of your power setting, airspeed, and RPM during the dive. And, note that at a 45 degree dive angle and 90 degree bank angle, a point on the ground directly below you will appear at your 1:30 (right bank) or 10:30 (left bank) position, a good way to know when you've crossed the boundary into the box.

The accompanying sketch (next page) shows an idealized, zero wind version of the box entry that I attempt to execute for my Advanced Free program. The plan is this: If I set up on base 942 feet (or about 1/3 of a box length) outside the box at 3500 AGL, roll into a 45 degree dive aimed at a point roughly halfway from the middle of the box to the far side, and start a pull 164 feet above my desired altitude, I should be able to hit level at 2000 feet, wait a "one count", then pull 6 G's to reach vertical exactly on the Y-axis. No gawking around trying to figure out where I am; it's all "automatic" after the initial set-up. Well, that's the plan, anyway. I'm accelerating on the 45 degree down-line, but even at 204 mph all the way, there would be 6 seconds for the wing wags, although time compression does set in here.

Regarding the radii and G-loads shown on the sketch, the initial radius of a looping figure is established by initial speed and initial G. When pulling (or pushing) from level, the +/- 1 G of level flight doesn't contribute to the radius. The G load must change continuously during the pull to maintain a constant radius, for two reasons: First, that 1 G of level flight vanishes to zero as you approach vertical. And secondly, you're slowing down. If R is to be constant and V is changing, G must also change. Result: if you're going faster, pull earlier. That's one of the joys of aerobatics. It's both a science and an art. Do I really think that anyone but me draws a diagram for a box entry?

Well, I haven't seen anyone else do it, but having been congenitally shortchanged in the art department, I lean toward the science for help. I did it at first just to gain a better understanding of the physics and geometry involved, and I do it if I encounter an Unknown that I can't mentally adapt my "standard" procedure to, or if I think that wind conditions are going to be unusual. It's part of "plan your flight and fly your plan."

A few last words on box entry. First of all, don't let a fancy box entry spoil your first figure. If something goes wrong, if you're not satisfied with position, altitude, airspeed, or anything else, don't pull for that first figure. Fly straight ahead out of the box, regroup, and enter again. And again, if necessary. If the first

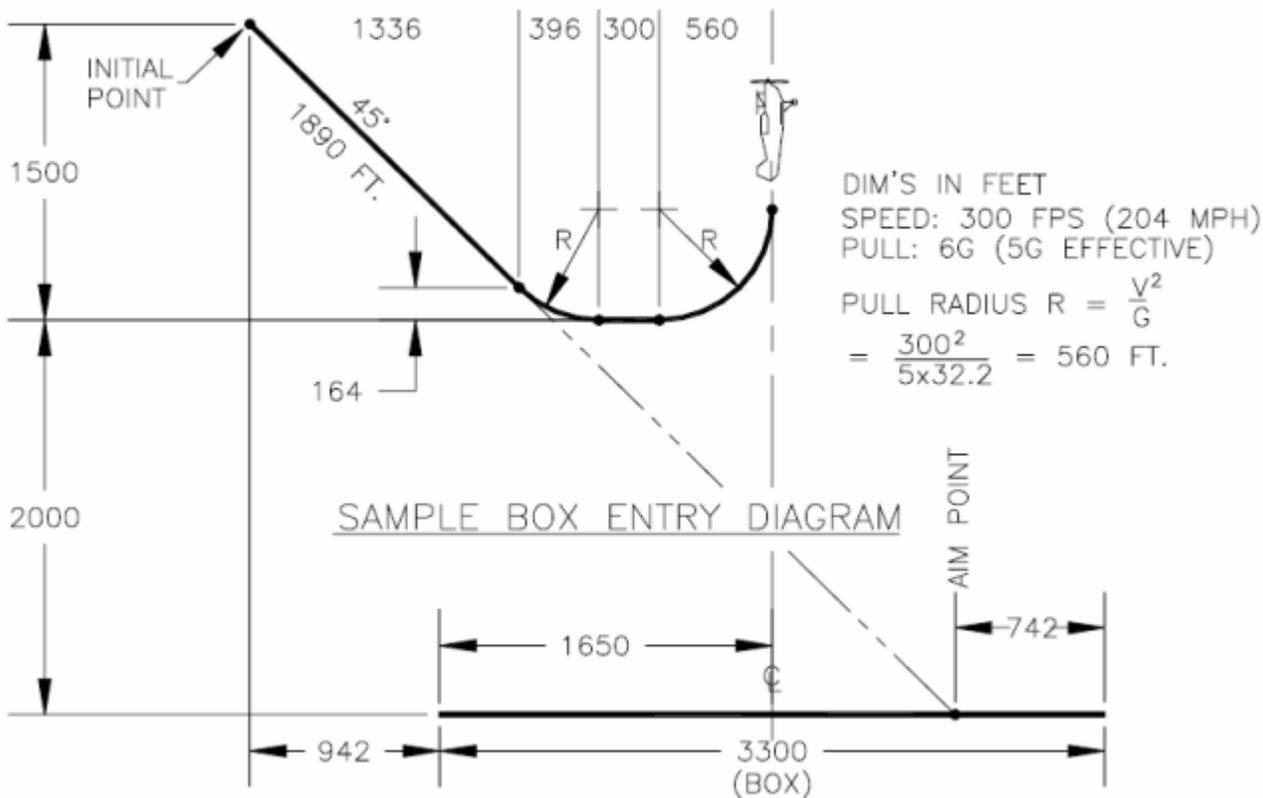


figure is a low-energy figure like a spin or split-S, don't dive in at 200 mph.

In IAC competition, you won't be penalized for skipping one or more of the wing wags, so if you've waggged once or twice and your pull point is coming up fast, skip the rest. Practice your box entry just as you practice your other figures. It may seem silly to practice diving 90 degree wing wags, but if you don't, you could find yourself 30 degrees off heading before you've even pulled for the first figure. Practice wags to the right and to the left (remember, it's best to wag toward the judges, and they could be on either side).

I find entering the box to be every bit as challenging as any other maneuver, and getting it right sets the tone for the remainder of the flight. And remember that this article isn't flight instruction. It's up to you to fly within your own limits and those of your airplane.



- Doug Sowder, 2001

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EAA Expiration Date: _____

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Competition: None Basic Sportsman Intermediate Advanced Unlimited

Aircraft: _____

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Next Meeting

Sunday, May 11th, 2008

4 PM

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