



## ***Accidents Deconstructed Dr. Ken Orloff on April 5<sup>th</sup>***

Potluck Dinner: The McGowan's Hangar at 6:00 PM

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Ken and his wife Lynne (the "Pres") are permanent residents at Pine Mountain Lake. Ken has been a full-time resident here since 1986. They live on the north taxiway loop, along with their three horses, three cats, one dog, four chickens, a rooster, and, by the way, their airplanes – a Ryan PT-22, a V-35B Bonanza, and a Lancair IV-P that was a ten-year project that first flew in 2002. Also, to hopefully break out of it shell and fly soon is Ken's Marquart Charger biplane project that he has been building since – well, let's just say it feels like forever.

Ken has a B.S. in Physics from Harvey Mudd, an M.A. in Physics and a Ph.D. in Mechanical and Aeronautical Engineering from UC Santa Barbara. He is a licensed Airframe and Powerplant Mechanic and holds FAA Inspection Authorization. He holds an Airline Transport Pilot Certificate, a CFI for airplanes and helicopters, and a CFII for airplanes. Since his first flight as a student pilot in 1964, Ken has accumulated in excess of 8000 hours of flight time.

Ken's business, Orloff Consulting, has been providing aviation accident consulting services to both plaintiffs and defendants in litigation for more than 25 years. Since 1981, every few years, Ken has been the PMLAA monthly speaker, telling us about his aircraft accident investigations and courtroom experiences as an aviation accident expert witness. Using multi-media graphics, computer simulations and animations to simplify complex subjects, Ken has presented his opinions in courtrooms around the world.

In the past several presentations, Ken has given overviews of a number of his cases, but this time he will present only two, so as to go into more detail. The first is the case involving a Lancair Columbia 400 that crashed at the Portland International Airport, and the second is the case of a Robinson R-44 helicopter that crashed at an airport in San Juan, Puerto Rico. Ken will present the evidence for the accidents and his reconstruction of the sequence of events. As he goes through the details of the accidents, all of us in the audience can try to sort it all out and decide what happened; he will then tell us how each case turned out.



## *President's Column*

*By Lynne Orloff*



**T**hank you, Vicky and Jeff, for bringing us Lt. Col. Jon "Huggy" Huggins and his wife, Linda. They were both delightful, entertaining,..and we'd love to have them for neighbors! The weather finally squeezed out some real wet stuff, which kept a few people away for the weekend, but we still had a great turnout with a lot of warm food filling the tables. Huggy added his warmed-up "space tubes" so we were invited to taste Chicken ala King (and a few other flavors) in a tube as eaten at 70,000 feet in a U-2. We all will be listening for that telltale sound of military power when Huggy next over-flies PML in a T-38...watch and listen...and wave! Love it!

When I took this job it was with the promise that Ken would help by presenting another group of his many interesting aviation accident reconstruction cases. It did mean he had to give some hours away from working on his Marquart biplane project, which means I owe him big time! He has two cases for you this next month that I know will keep you intrigued. Thank you, Mel and Suzanne McGowan for the use of your hangar for Ken's presentation.

Wayne Handley suggested that between 4 and 6 P.M. on one of our warm month meeting nights, we open up our hangars to display our projects, hangar queens, and flying craft that we store away from the weather. Let's try for June's meeting when it shouldn't be as hot to walk the taxiway...and we can organize a golf cart brigade to escort those that

would rather ride. If the weather does not cooperate, September is our back-up date. Contact me if you are interested in participating by opening up your hangar or you have a golf cart to share. Great idea, Wayne!

Thank you, everyone, for your help. We have had a great set-up and clean up volunteer response and it is so appreciated. We work hard to leave every hangar as clean, if not cleaner, than we found it. In clearing hangars, sometimes other owners step up to store the displaced aircraft. Thank you all for your generosity, your time, your inputs and suggestions.



**Ken Orloff's Marquart Biplane Project**

## *Social Column*

*By Dian Martin*

**W**e had a great crowd and fantastic potluck contributions for our March meeting at Jeff & Vicky Benzing's beautiful hangar. Our speaker U-2 pilot Jon "Huggy" Huggins was very entertaining and should possibly consider hitting the stand up comic circuit as he prepares to retire. He even passed around "tube foods" for us to taste which is what the U-2 pilots must eat while in flight.

Our April 5th meeting will be Mel & Suzanne McGowan's hangar at 6:00 p.m. and our speaker will be Dr. Ken Orloff. I heard many comments about how great and plentiful the food was and I thank everyone for their help. Setup and tear down times are as usual at 10AM.

*From the Airports Manager  
By Jim Thomas*

Recently, there have been a couple of instances where pilots were not able to reactivate the pilot controlled lighting (PCL) (runway lights) while feedback from others has indicated that the PCL system was working just fine. I've checked the PCL system myself and it has worked every time when using my very weak powered handheld radio in direct line of sight with the antenna. I tested the timers and they seem to work just fine. I also reactivated the lights after they time out or turn off. For those that don't know, the lights stay on for 15 minutes after activation and the lights should be able to be turned on again immediately after automatically turning off. Trying to re-initiate the timer once activated does not reset the timer.

Whatever is happening is intermittent and difficult to troubleshoot or a problem with the age and/or location of the PCL antenna. I've been told that the PCL system, including antenna were installed before the 5 County owned hangars were constructed. Observation suggested that the old antenna was located such that any signal coming from low to the west would be blocked by the metal hangars. Of course any signal broadcast from the east end of the airport would be blocked by the hill located on the southeast side of the airport.

On February 25<sup>th</sup> a new antenna, pole, cable and connectors were installed. Testing indicated that my very weak powered handheld radio could turn on the lights from ground level at the west end of the airport suggesting a great improvement in the PCL system reception. I'm hoping that this will resolve the problem experienced recently by some pilots. However, if you do experience a problem with the PCL system, please contact me directly. I really would like to receive first-hand reports of problems.



*Safety Column  
By Marle Hewett*

### What is "Fly-By-Wire" Anyway?

It's a deep technical topic that's often misunderstood. If you have a bit of curiosity and possibility a few preconceived opinions, stay with me for a decidedly technical but interesting read.

If you've flown in a Boeing 777 or 787, any of the Airbus series 320 through 380, or any of the newer military fighters, you've likely flown in an airplane with a fly-by-wire (FBW) flight control system.

They all have the following in common; a primary control path from control deflections (stick, yoke, rudder) transformed into an electrical signal that's sent by wire to a servo that drives a hydraulic power actuator that moves an aerodynamic control surface.

Notice, these systems are electrically signaled and hydraulically powered. That distinguishes them from "power-by-wire" systems that are electro-mechanical all the way (no hydraulics). They're common for secondary controls but not for primary controls.

Before FBW, hydro-mechanical systems dominated the large aircraft world including the majority of the military tactical aircraft of the 60s. Cockpit control deflections connected to push-pull rods and cables to a servo to a hydraulic power actuator to drive a control surface. It's the servos that are different between FBW and hydro-mechanical. The FBW servo handles an electrical input; the hydro-mechanical servo handles a mechanical input. These systems had no pure mechanical backup: that final step in the control path was always hydraulic. Think Boeing 747, 757, 767.

Before that, "power-boost" systems were the rage. They were mechanical all the way except for the inclusion of an "in-line" hydraulic power package. Think Boeing 727, 737. They were simple in design and the mechanical backup feature was there naturally. If the power package quit, it just took a little more force on your part to horse the plane around. Think power steering in your car.

Finally, there are the mechanical systems (push-pull rods, cables) that most of us fly. You know these systems well.

So what does FBW offer in return for it's considerable complexity? The big one is increased range for a given airplane size and weight. How on earth does that happen? Stay with me here: 1) FBW

allows stability and control augmentation to be easily incorporated through sensors and computers (analog or digital). 2) That allows the plane to fly with less static margin (more aft CG). 3) That means that the normal download the tail must carry for static stability can be reduced. 4) That means the wing doesn't have to generate quite so much lift to overcome that tail download. 5) That means induced drag from the wing can be reduced which means a slightly lower angle-of-attack in cruise: typically about ½ degree. 6) That means the engines don't have to generate quite so much thrust in cruise. 7) That means a lower fuel burn and (are you still with me?). 8) That means range can be increased: typically between 5 and 10%. Whew!!

Which is why Boeing HAD to incorporate FBW in the 777 to compete with Airbus: it's all about range, in other words - money!

But, what about safety, reliability and maintainability? Think about this. These FBW systems are usually triple redundant electrically, triple redundant hydraulically and dual redundant mechanically. In airliners like the 777, there is, in addition, a hydro-mechanical path (cables and push-pull rods) along with the electrical paths to most controls. What's more, you can bypass all those computers by what's called the "direct electrical link" mode (usually named something more descriptive like "backup flight control").

Bottom line: Can you fly these airplanes if you lose ALL electrical power? – YES! Can you fly these airplanes if all those computers crash? – YES! Can you fly these airplanes if you lose ALL hydraulics? – NO, you're done flying. Like the hydro-mechanical systems that preceded FBW, that final step in the primary control path is ALWAYS hydraulic. Why? The engineers will tell you triple redundant hydraulic is more reliable, less complicated, less expensive and more practical for primary control paths than pure mechanical for big airplanes.

And there's something else. Boeing FBW design philosophy differs considerably with that of Airbus. Bottom line here? Fly Boeing! I'll tell you why next month.

## ***Books Needed!*** ***By Virginia Richmond***

Friends of the Groveland Library needs your gently used books and movies!

The Friends raise money by selling used books, videos and DVDs downstairs at the library every Saturday. The funds keep our library open five days a week and support reading programs for local kids. We're running low on inventory, so please check your shelves and bring in your donations. Tax-receipts provided. Thanks!

## ***PMLAA 2015 Calendars*** ***Call for Aircraft Photos***

After a rousing success with the 2014 PMLAA Calendar, we're starting to plan for the 2015 edition. If you are interested in having your aircraft photographed for the calendar, please contact the PMLAA editor by emailing [newsletter@pmlaa.org](mailto:newsletter@pmlaa.org). We will accept photos of aircraft, but you must have the rights to the photo or make sure the photographer has granted permission to use the image in the calendar. We will also take photos of your aircraft for you. Photos should be high-resolution JPEG files (the higher the resolution the better). All proceeds go towards the association's budget to help support Airport Day, our scholarships, and other community projects.

Speaking of calendars, we have a very few remaining 2014 calendars available at a deep discount price. At the next PMLAA potluck dinner, visit the table where the drink tickets are sold to purchase yours.



## *Guess The Airport*

Try to guess the airport pictured below. The airport is within the San Francisco Sectional and is an interesting and easy destination to reach from Pine Mountain Lake.

Named for a heroic Brigadier General from WWII who flew his stricken B-17 while his crew bailed out, this airport got its start as a military flight training facility, a basic flying school during the second World War. It remained with the military for several decades as part of the Strategic Air Command, as the home of lots of large fortress-like planes parked along the spacious ramp area. It was converted to civilian use in the 1990s; now it houses a great military aviation museum that's filled with some of the old planes that flew from there. The generous, almost 12,000' runway allows even the beginner pilot a chance to land and take off a couple of times before leaving the asphalt, though that might not be appreciated by the otherwise friendly tower controllers. I have not visited the terminal building for a couple of years, but it used to feature comfy leather chairs and a friendly cat who greeted all who entered.

Where are we?





## 2014 Meeting Calendar

<b><u>Date</u></b>	<b><u>Program</u></b>	<b><u>Time &amp; Location</u></b>
April 5	Dr. Ken Orloff	6:00PM location McGowan's Hangar
May 3	Jonna Doolittle Hoppes	6:00PM location Wayne and Alan's "Toybox"
June 7	Lori Losey	TBD

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