



THE LEADING EDGE

NEWSLETTER OF MUROC EAA CHAPTER 1000

Voted to Top Ten Newsletters, 1997, 1998 McKillop Award Competition

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<http://www.eaa1000.av.org>

July 2018

Chapter 1000 meets monthly on the third Tuesday of the month in the USAF Test Pilot School Scobee Auditorium, Edwards AFB, CA at 1700 or 5:00 PM, whichever you prefer. Any changes of meeting venue will be announced in the newsletter. Offer void where prohibited. Your mileage may vary. Open to military and civilian alike.

This Month's Meeting:



HOMEBUILDER'S DOWN DAY

You
Tuesday, 17 July 2018
 Whenever
 Your Workshop

By order of the **Kommandant** and your **Board of Directors**, the **Project Police** of EAA Chapter 1000 are hereby directed to meet individually in groups for the regularly scheduled meeting/gathering/event on the third Tuesday of the month. Yes, you are empowered to figure out for yourself how to entertain yourself from 1700 to 1900 on 17 July 2018. The **Vice Kommandant** is expected to be on his way to Wittman Airfield in Oshkosh WI. **Brian Purdy** will be practicing his answer to the recurring question "Will the Samson Switchblade ever fly?". **Cain'n Abel** will be getting ready to leave via Aluminum Death Tube, as he is already late if he was going to travel by his **Champ**. **Opie** will probably already be in Oshkosh, and **Stormy** will be on the way, not that either of them would show up for our meeting anyway. Since it is summer, many of you have already made plans to be somewhere else on that day, so we're not bothering to put together a program for you to miss.

Homework: The **Kommandant** has assigned you tasks for the time you are not at the chapter

meeting. If you have a current airplane project, put in a couple of hours of building time on your project. If your airplane is in need of maintenance or upgrades, spend a couple of hours working on that. If you don't fit in either of those categories, then step to your computer or device and go to <http://www.eaavideo.org>. Type "Chapter Video Magazine" in the search box and click "Search". Pick one of the month's magazine and watch it. Alternatively, go to Amazon.com and order "Mike Busch on Engines". **Evil Editor Zurg** will be watching your Internet traffic, so we will know if you have completed your assignment.

Next month's Baseball meeting will be on 28 August at The Hangar with the Lancaster Jethawks. Take note that will be the **FOURTH** Tuesday.

- **Erbman**

Subbing for the **Vice Kommandant**

ATTENTION ALL GEEKS, NERDS, NERDETTES, AND IT-Wannabes

Your Chapter is in need of assistance in the form of a **Webmeister**. You may have noticed that the chapter website (www.eaa1000.av.org)...once lauded by EAA higher-ups...has stagnated. I'm sure you've all gone to a site on the interweb and been disappointed with the age or irrelevance of its content. That problem can speak volumes about the vibrancy of an organization and its membership. Anyway, I know there is someone out there in Chapter 1000-land who is dying for a way to contribute to the Chapter's success and has the required skills to produce a first-class, modernized web presence suited to our dynamic and talented membership. Please contact me (or any board member) if you are interested in taking on this critically important task. Further, it would be just super if someone (you know who you are) who is an expert user of social media would step up to establish and administer a **Chapter 1000 Facebook page**. While these two IT items could be done by a single member, I would encourage sharing the taskings among two or more members.



- **Gary Aldrich**
 Kommanding

Last Month's Meeting

EAA Chapter 1000

Bearhawk Manor

Rosamond, CA

19 June 2018

Gary Aldrich, Presiding

Eight stalwart **PPOs** gathered together at Bearhawk Manor, home of **Erbman** and **Tuki** and Junior **PPO Emmy**, to experience the culinary event of the season. Yes, it was **Tuki's Taco Tuesday**, once hailed by **Opie** as "better than anything Coach's ever made". There were corn and flour tortillas, seasoned beef, chicken, and pork, with grilled peppers, spanish rice, refried beans, and nacho cheese, with additional condiment offerings. No hot sauce necessary to give these tacos some flavor, as the ingredients were already expertly seasoned. If you are salivating from just reading this, then you've got the right idea.

As ice cream sandwiches were passed around, the **Kommandant** got to the business part of the meeting, which was **Vice Kommandant Steinlin** reporting on his experiences at the recent **Chapter Leadership Workshop**. Some suggestions were made to improve our advertising (see page 1), along with questions of whether the younger aviators or aspiring aviators of today are even interested in attending meeting events. You can't say that people want to come but are scared off by the process of accessing the base, because this event was clearly not on base, readily accessible, and even with the promise of yummy food, many people, probably including you, didn't bother to show up.

As the discussion was completed, a takeout container was issued to each of the members with a plea to fill it up with the remaining food and take it with you.

Epilogue

Some of our members, namely **Dave Vanhoy** and **Kanard Kelly**, were unable to attend due to being trapped in the interminable Curriculum Planning Council at TPS that night. Both were offered a chance to come by and pick up a CARE package of the leftovers. As they both delayed a day, they got some of **Tuki's** next-day culinary creation thrown in as well. **Helida Vanhoy**, who was in **Puerto Vallarta** visiting her sister during the meeting, came home to find a little bit of the chicken remaining from what **Dave** had already scarfed. **Helida**, a life-long expert in Mexican food, ate the chicken and was immediately impressed. "WHERE DID YOU GET THIS? THIS IS AMAZING!" she asked **Dave**, who non-chalantly responded "From **Tuki**." Recipe transfers are being negotiated as we go to press. Most of this is true.

- Russ "Erbman" Erb

Emergency Secondary Backup Minister of Propaganda Chapter 1000 of the Experimental Aircraft Association of these United States of America and Occupied Territories
"We have more zeroes in our chapter than any other!"

Kommandant's Korner

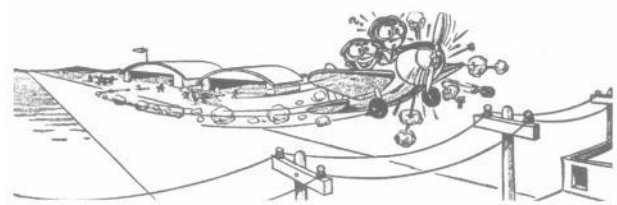
Do you ever dial up the ATIS, listen for the winds, runway, and altimeter setting and then switch to ground without listening to the end of the broadcast? After all, it's **HOT** in the cockpit (unless you have the frozen **Bearhawk** mod), you're sweating, and you yearn to



slip the surly bonds and climb into cooler air. Did you miss anything important on the ATIS? Chances are you didn't hear the information given at the end of the recorded announcement, right after he says, "Remarks". That critical piece of info is the density altitude (DA). Very often in the summer at high(er) elevation airports the

ATIS will report the DA as a remark after the standard information is given and before the announcer says something like, "advise on initial contact you have information (Alpha, Bravo, etc)".

Remember way back when you took ground school for your pilot certificate and the instructor droned on about the dangers of high density altitudes? Well yeah, you say, but I fly out of Fox Airfield which is "only" 2347 ft MSL. And besides, the runway is 7201 feet long. Well, the NTSB accident database is chock full of stories of pilots who disregarded DA and then had it complete the accident "chain" and ruin their day. We recall that density altitude is calculated by modifying pressure altitude with temperature. Since our aircraft operate on density altitude (unlike your body, which operates on pressure altitude) the result of the DA calculation tells you at what field elevation your airplane "thinks" it's operating. Performance **WILL** be degraded by reduced engine power resulting in longer ground rolls, and higher ground speeds for takeoff. Those two factors will give the complacent pilot a temptation to rotate before achieving liftoff airspeed. You may, indeed, lift off, but then settle or "hang" a few feet off the ground until sufficient airspeed is achieved to establish a climb.



I departed runway 6 at **WJF** one sultry afternoon, not unlike today. The temperature was over 100 degrees F and the winds had been light and variable. I was flying a **180 hp Beech Sundowner** carrying four adults and whatever gas I could carry that would bring us up to maximum

takeoff gross weight. The mission was a pleasure flight to **Las Vegas** (KLAS) to take in a **Bette Midler** concert at the MGM Grand. I listened to ATIS and expedited my taxi to help keep my passengers from melting. If I noted the DA, I don't recall putting any undue importance on the fact that it was over well over 5000 ft. I had a fair amount of time in the airplane and I was pretty confident in its performance capabilities. Those last three sentences were the first "links" in the chain. As I was approaching departure end of runway 6 the ground controller said that the wind had shifted since the ATIS was recorded and that I would have a slight (5 kt) tailwind if I chose to stay with runway 6. He offered to let me turn around and taxi to runway 24 but I declined. It was, as **PPO Doolittle** says, "a billion and six" degrees in the cockpit and a runway 6 departure would get us on our way and in the right direction for our destination. There's another link. As I pushed the power lever to the forward stop I immediately noticed that the acceleration was, shall we say, "underwhelming". After about two thousand feet of roll the airspeed indicator sluggishly came off the peg and approached 40 knots. After another thousand feet or so it was just touching my planned 60 knot rotation speed and I hauled back on the yoke. The trusty Sundowner staggered into the air to an altitude of about a half wing-span and then seemed to level off of its own accord with the nose in the air and airspeed indicator frozen at about 65 knots. At this point I noted the end of the runway was fast approaching, making a high speed abort problematic since I would have to land and use heavy braking to account for the high groundspeed. I decided to tough it out and imperceptibly lowered the nose to allow the airplane to accelerate a bit in ground effect. This brought us closer to the runway but we did not touch down. The airspeed indicator continued its maddeningly slow progress toward 80 knots and we crossed the departure end of the runway at an altitude of about **30 feet AGL**. Believe me, the Joshua trees and tumbleweeds looked pretty big as we began a slow climb. Having achieved a reasonable climb speed we proceeded on course, finally getting to a cooler cruise altitude near Barstow. Buy me a beer at our next gathering and I'll tell you the story of the return flight.

Did you count all the links in this story? Fortunately, I didn't collect enough links to complete the chain and trigger an accident. Instead of bent metal and broken bodies I had a lesson in high DA aircraft performance seared into my aviator brain. Modern avionics systems in our aircraft today often have the option of displaying DA, having done the math for you. My Garmin GTX330ES transponder is configured with an outside air temperature probe. I never start taxiing for takeoff until I have selected the DA display...even if the DA has been announced on the ATIS. I never takeoff with a tailwind regardless of the pressures of cockpit comfort or scheduling. I always mentally prepare myself to abort the takeoff if I am not safely airborne before passing a predetermined point on the runway. At Fox Airfield I use the midfield taxiway as that point. I always lean the mixture for maximum power, either during the run-up or, if departing a long runway,

immediately after beginning the takeoff roll. I use my Shadin fuel-flow meter readout to get me in the ballpark of the proper mixture setting, knowing that 15-17 gallons per hour is recommended for climbs above 5000 feet DA. After liftoff, I level the aircraft in ground effect until I reach V_x or V_y speeds, depending on runway length and/or obstructions.

You can all log a small amount of time for ground training...you're welcome...now get out there and aviate. No meeting this month as usual due to summer travel plans, so until we meet again....

Fly Safe and Check 6...or at least check DA!

- Gary Aldrich
Kommanding

Yelp Review: Low Cay

As a proud Millennial, I am an avid Yelper. With my recent visit to **Low Cay** in June, I couldn't help myself but to do exactly what I do best...write a review!! Your experience may be different from mine, should you decide to visit **Low Cay**, but hey, for the sake of entertainment, here it is (and I was told that the 10% rule applies):



Oh, where to start...first of all, **Low Cay** is one spectacular location! It's got like a thousand rooms and bathrooms... All bathrooms are designed to be old people friendly, so you don't have to worry about tripping on anything and breaking your hips! Compared to **High Cay**, **Low Cay** gets plenty of sunlight during the day. The upstairs hallway has a direct view of the street with all them greens, and I was this close to having my **Sound of Music** moment, twirling around with arms wide open and singing...but evidently, I do have enough self-control.

The guest room had a mini bar, fridge stocked with beer, microwave, spacious closet, VERY nice mattress (for all you back pain enthusiasts, like myself, you definitely won't wake up with pain!), and access to a second floor balcony. During my stay, I didn't experience any early morning take off noise, but pretty much like the rest of the house, it's got a nice view of the runway.

Upon arrival, I got a complimentary tour of the neighborhood/airport in their golf cart, and they made me feel right at home by taking me to their neighbor's house with 5 and 3 year-olds! Following the tour was a walk-through of the hangar, where one gigantic ladder, Glasair, and the other big plane reside. Can't forget the office space upstairs tho! **Opie** couldn't help himself but to give me the full run down on what's what in the office and what he can do with this space, because you know, **chicks dig that**, but that was quickly shattered by his failed attempt to open something on his computer. Something about that error message noise coming from a computer isn't exactly sexy or impressive. LOL

Anyway, I am well aware that ANY trip to Texas doesn't count unless you have one good BBQ or Mexican food, so for dinner, we went to a Mexican restaurant nearby. I must confess that on our way to dinner, I felt like I was committing some offense by riding in a non-Texan approved vehicle, which is their **Chevy Volt**. As I understand it, the state's officially recognized vehicle is a **pickup truck**, but since those ride-on trucks you'll find at toy stores have not been road tested for **Opie**, an electric car it is. :p By the way, if you ever visit **Low Cay**, you must go to **Mary's Tacos** at some point. That place was simply divine. This is also where I learned **Gail's** equivalent of her "Starbucks Name". If you don't know what that means, find a millennial nearby and ask.

The true entertainment of **Low Cay** starts and ends with the sit-out in their backyard. If you're familiar with **Opie's** sit-out at his previous house, same idea, but with an upgraded fire pit. As always, if you want to talk about planes, beers, and titties, **Opie** is your guy. If you prefer more down to earth conversation, **Gail** is your person ;) . Anyway, if you're a weirdo like me and feel the need to stretch after a long flight, the sit-out area is perfect for that. There I learned the important key features of **Low Cay**, which are... unlimited AND complimentary **dog kisses!** As the Texas heat died down, and the amount of alcohol consumption increased, I learned another great feature to their house, which would be that if you take the side door, you have a clear shot down the hallway to go to the restroom, so regardless of how drunk you may be, you really don't need to be able to walk a straight line! Now I don't know about you, but after about 4-5 Moscow Mules, that seemed like a GREAT feature. :) If you stay out there at night, I have to warn you not to sit on the ground like I did...because you will likely get a visit from a scorpion just cruising by unannounced. This particular scorpion visit amplified the entertainment value...how?...Following my "Oh, heeeelllllll no", after seeing that scorpion, **Opie** got his black light out to go scorpion hunting around the backyard. I think we were a marshmallow on a stick away from having the entire camping experience there for a second.

To those who are wondering, yes, my actual yelp reviews are lengthy too.

Anyway, all the jokes aside, to **Doug** and **Gail**, I truly enjoyed my day at **Low Cay!** Thanks for letting me stay! :) **Xoxo, Tuki**

- **Satoka "Tuki" Erb**
Schmoozemistress

Well! There's Your Problem!

Last December I was flying the **Combat Bearhawk**. Shortly after takeoff, I noticed something unusual. The EDM-930 engine monitor alarmed, and looking at it revealed an excessively high Exhaust Gas Temperature (EGT) on cylinder 4. This left me confused. How could

one cylinder burn hotter than all of the rest? Was there any danger? Did I need to do anything to address it? Before I came up with any answers, I reduced the RPM from 2700 to 2400, and the excessively high EGT went away. Problem solved? At least for now...until the next flight, when the same thing happened again.

Baffled by this occurrence and not knowing what could cause it, I did what most people do—I simply forgot about it. After all, the problem had gone away.

Later I would run across a piece by Mike Busch, who confirmed that high Cylinder Heat Temperatures (CHTs) is a problem that needs immediate attention, while high EGTs require no immediate action.

Fast forward to late April and I'm borescoping the engine as part of the condition inspection. Everything was looking great until I saw this in cylinder 4.



That's the lower spark plug, with a whole bunch of **krap** on it. Lead fouling, to be specific. I've never seen so much fouling on any plug on this engine.

Upon removal, this plug looked like this.



I don't think you could jam any more krap into that plug.

So what do these two events have to do with each other? Let's talk for a minute about why our engines have dual ignition. Most Private Pilot candidates would say for

redundancy in case one magneto fails. While true, that's not the primary reason.

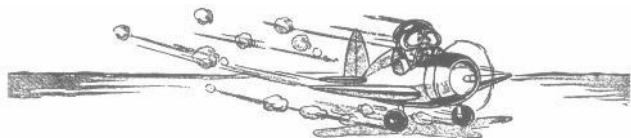
While gasoline mixed with air burns very rapidly, it does not burn instantaneously. There is a measurable speed for this flame front to propagate. In car engines the cylinder bore (diameter) is fairly small, on the order of 3 inches or less. This is small enough that a flame front can get from a single spark plug all of the way across the cylinder before the piston moves significantly down the cylinder. However, the bore of a typical cylinder on a Lycoming or Continental engine is greater than 5 inches. With this large bore and a single spark plug, the fuel-air charge would still be burning well after the piston started moving down the cylinder. To ensure the fuel-air charge burns sufficiently quick, it is lit at two different locations by two spark plugs. That way, each flame front only has to cover half of the cylinder.

This effect is seen every time we do a run-up with conventional magnetos. When you switch off one magneto, the RPM drops. This drop occurs because the fuel-air charge is ignited by only one spark plug and takes longer to burn. This burning is less efficient because the combustion pressure is reducing as the piston moves down the cylinder. (With dual Lightspeed electronic ignition as installed in the **Combat Bearhawk**, no RPM drop is seen when turning off one ignition. This is because the functioning ignition system senses the failure of the other ignition system and advances the spark (fires the spark earlier), such that the burning is complete before the piston starts down.)

Another effect of inefficient burning is an increase in EGT. Normally the products of combustion cool as they expand while driving the piston down. If the fuel-air mixture takes longer to burn, it has less of the expansion stroke available for cooling. Therefore, the gasses are hotter than normal when the exhaust valve opens.

In my case, I think the lead fouling was reducing the intensity of the spark, rather than eliminating it altogether. During run-up, I check that all of the plugs are firing by turning off each ignition system individually and watching the EGTs. The theory is that if a plug is not firing the EGT will rapidly drop. During the run-up the fouled plug worked sufficiently to maintain the EGT.

Immediately after takeoff, the RPM was at 2700. Because of the high RPM, the time available for the combustion event was shortest. Under the high combustion pressure, the fouled plug either stopped firing or was less effective, so that cylinder was not completely burning, and therefore the EGT went up. When the RPM was reduced to 2400, the combustion pressure reduced, and the plug probably started working better. Additionally, the fuel-air charge had slightly more time to burn, so the EGT reduced to normal values.



The Lesson

So what can we learn from all this? If a cylinder starts showing excessively high EGT, then it is time to pull the plugs for that cylinder and check for fouling. If fouling is not found, then look for other ignition problems.

- Russ "Erbman" Erb

Highly Efficient Aircraft Ground Handling

Recently, at Pixel's Bark-Mitzvah, **PPO Mike Machat** was telling us about how he recently found a photo of himself as a line boy in an earlier life. Who needs a fancy airplane tug to move airplanes around?

"Great seeing everyone last night. Here's living proof of how to ground-handle a Cub!"




"Photo was taken in March 1967 at Zahn's Airport in Amityville, Long Island."

A check of the FAA Database shows that the aircraft is a 1946 Piper J3C-65 S/N 16599, registered in Oyster Bay NY, which means it is still on Long Island. **Mike** said "Neighboring Republic Field (once home to the great manufacturer) now serves as the primary GA airport for Long Island, and the town of Oyster Bay is located on the North Shore but don't know of any airports there."

Mike also related as to how far more recently he was talking to a group at Flabob airport and tried to demonstrate this technique with a Cub that was there. The results didn't come out quite the same. Must have been an aft cg Cub....

Web Site Update

 Just a reminder that the EAA Chapter 1000 Web Site is hosted courtesy of Quantum Networking Solutions, Inc. You can find out more about Qnet at <http://www.qnet.com> or at 661-538-2028.

Chapter 1000 Calendar

Jul 10: CNX EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., El Indio Restaurant, Rosamond Skypark, Rosamond CA. (661) 609-0942

Jul 17: ~~CNX EAA Chapter 1000 Monthly Meeting~~, 5:00 p.m., Edwards AFB, USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Jul 23 - 29: EAA AirVenture. Oshkosh WI.

Aug 14: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., El Indio Restaurant, Rosamond Skypark, Rosamond CA. (661) 609-0942

Aug 28: **EAA Chapter 1000 Baseball Meeting**, 6:00 p.m., The Hangar, Lancaster CA. (661) 609-0942

Sep 11: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., El Indio Restaurant, Rosamond Skypark, Rosamond CA. (661) 609-0942

Sep 18: **EAA Chapter 1000 Monthly Meeting**, 5:00 p.m., Edwards AFB, USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Oct 9: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., El Indio Restaurant, Rosamond Skypark, Rosamond CA. (661) 609-0942

Oct 16: **EAA Chapter 1000 Monthly Meeting**, 5:00 p.m., Edwards AFB, USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Nov TBD: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., El Indio Restaurant, Rosamond Skypark, Rosamond CA. (661) 609-0942

Nov TBD: **EAA Chapter 1000 Monthly Meeting**, 5:30 p.m., Flying Dog Ranch, 4400 Knox Ave, Rosamond CA. (661) 609-0942

Dec 11: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., El Indio Restaurant, Rosamond Skypark, Rosamond CA. (661) 609-0942

Dec 18: **EAA Chapter 1000 Festivus Etc Celebration**, 6:00 p.m., Kommandant's Kwarters, 42370 61st Street West, Quartz Hill CA. (661) 609-0942

To join Chapter 1000, send your name, address, EAA number, and \$20 dues to: EAA Chapter 1000, George Gennuso, 3119 Lennox Ct, Palmdale CA 93551. Membership in National EAA (\$40, 1-800-843-3612) is required.

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Inputs for the newsletter or any comments can be sent to Russ Erb, 661-256-3806, by e-mail to erbman@pobox.com

From the **Project Police** legal section: As you probably suspected, contents of The Leading Edge are the viewpoints of the authors. No claim is made and no liability is assumed, expressed or implied as to the technical accuracy or safety of the material presented. The viewpoints expressed are not necessarily those of Chapter 1000 or the Experimental Aircraft Association. **Project Police** reports are printed as they are received, with no attempt made to determine if they contain the minimum daily allowance of truth. So there!

THE LEADING EDGE
MUROC EAA CHAPTER 1000 NEWSLETTER
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ADDRESS SERVICE REQUESTED

THIS MONTH'S HIGHLIGHTS:
NO REGULAR MEETING THIS MONTH
WATCH OUT FOR DENSITY ALTITUDE
LOW CAY REVIEW
LEAD FOULING

