experimental aircraft association

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 *November 2013*

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:

Cookout with the USAF Academy Cadets

Tuesday, 19 November 2013
1830 hrs (6:30 PM Civilian Time)
Flying Dog Ranch
Rosamond, CA

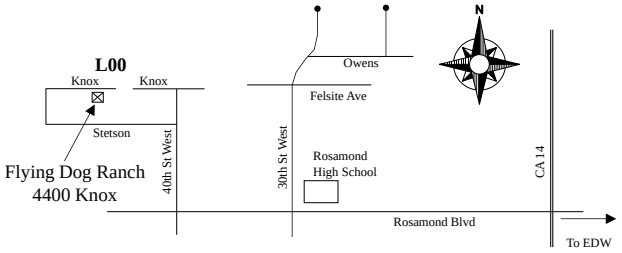
One of the benefits your government brings to you is an excuse to get together with your fellow ***Project Police Officers*** twice a year for food and fellowship. What does the government have to do with that? Every April and November they allow the US Air Force Academy cadets enrolled in the Flight Test Techniques course to come to Test Pilot School to fly T-38s for their final project. While they are here, we invite them to an EAA Chapter 1000 meeting and use it as an excuse to eat!

In spite of all the budgetary buffoonery taking place on the Potomac, the cadets are still coming. Since this is November, we are expecting 16 of the proto-officers.

Just like in April, **Gail** and **Opie** have planned their schedule poorly and will not be in town to host the party. Once again, ***PPO*** **Bill Irvine** has graciously offered for us to take the party across the street to the **Flying Dog Ranch** (4400 Knox). We expect the standard menu, with expertly prepared ***Project Police*** **Burger** and all appurtenances thereunto. You will probably be asked to consume your fair share of **Tuki Kukis** as well.

Don't forget to engage the cadets in some conversation. It's easy to start—simply ask the cadets a broad question like "Where is your first assignment?" or "What mission did you have to design for in your Aircraft Design course?" My personal favorite is "What is the latest stupid rule to come down?" Trust me, there is always something. Get them talking and you may even get to tell them about your airplane.

Feel free to do something crazy so that **Cobra** has something different to write about.



- Erbman
For the **Vice Kommandant**

Last Month's Meeting

EAA Chapter 1000
USAF Test Pilot School
Scobee Auditorium
Edwards AFB, CA
15 October 2013
Gary Aldrich, Presiding

Eighteen members and guests arrived to find the TPS still battling the parking lot refurbishment. We imbibed the usual Tuki cookies, chips, salsa and sodas before the main event of the evening.

Our guest speaker was **Scott Loftin**, resident of Rosamond Sky Park and owner of 3 and a half airplanes (a C-152, two Glasairs, and half interest in a Grumman Tiger).

Scott refers to himself as a freelance engineer, usually involved with medical devices, who just happened to get involved with **Sage Chesire Aerospace**, the lead contractor for the **Red Bull Stratos Project** "mission to the edge of space" involving the 14 October 2012 record freefall and speed records set be **Felix Baumgartner** (see redbullstratos.com).

Scott's involvement began in May 2010 when conducting some business with **Jeff Landon** of High Desert Avionics at WJF. Jeff was working on the suit chest pack, and subsequently put Scott in contact with **Art Thompson** of Sage Cheshire. Scott originally did some work on the Boot and Glove Warmer controls, but went on to work on the Principle Capsule Display and the OnBoard Data Acquisition/Display System (OBDA/DS), improvements on the Chest Pack as well (developing the "ScottFunBoard" over the 2012 Superbowl weekend), and was eventually involved with every system of the capsule except for the video system. Scott had lots of pictures and electrical diagrams, but since electricity mostly eludes me, his Jedi mind tricks had no effect. I did like the pictures, though.

Scott shared lots of insights regarding the capsule pressure chamber testing at **Brooks AFB**, the 9 month delay due to legal challenges, the three test flights, and some of the personalities involved. An interesting factoid was that the balloon used for the record flight had a 24 million cubic foot capacity (yeah, you read it right- 24 MILLION cubic feet).

As confirmed by the world governing body for aeronautic records, the Fédération Aéronautique Internationale (FAI), the following records were set for the flight:

Maximum Vertical Speed (without drogue) 1,357.6 km/h (equivalent to 843.6 mph / Mach 1.25)

Exit (jump) **Altitude** 38,969.4 meters (equivalent to 127,852.4 feet) above mean sea level

Vertical Distance of Freefall (without drogue) 36,402.6 meters (equivalent to 119,431.1 feet)

All succeeding **Joe Kittinger's** 1960 record of 102,800 feet. Joe, by the way, was an advisor and team member on the Stratos project.

The most interesting factoid was that this was Scott's first aerospace related project. Not a bad start.

Victory was declared and activities transferred to the **Burger King Dead Cow Emporium** where Scott was "super-sized" in appreciation of his time and willingness to be seen in public with us.

I feel compelled to report that one of the soda dispensers was INOP. It surrendered ice only- no soda, forcing the thirsty diner to move to the next dispenser. **Houdu** was the first to make the discovery, and as each member completed his order and moved through the queue to get a drink, each previous member was able to observe the calamitous travesty with evil amusement, never even considering to warn them of their impending doom. It was just sick…but amusing none-the-less.

Most of this is true.

- Kent Troxel
Minister of Propaganda
Chapter 1000
"We have more zero's in our chapter than any other!"

Kommandant's Korner

Greetings from row 12 of an aged American Boeing 757 chugging its way up to FL400. We left the Dallas-Fort Worth (Ft Worth-Dallas for **Erbman**) airport a few minutes ago on the final leg of my shutdown-delayed TDY to Wright-Patterson AFB in beautiful downtown Dayton, OH. I noticed some grey-headed dead-heading pilots a couple of rows up ahead so I am comfortable composing this submission. I may even have a cocktail knowing that I only have to be a backup to the backup if the folks in the armored room up front decide to stroke out.

Erbman had asked me if the recently announced relaxation of the Personal Electronic Device (PED) rules had taken effect. I can report that my trip might have just spanned the moment of policy change. On the flights to DAY last Monday the rules were the same as they have been since the invention of the cellphone. On my flight this morning from DAY to DFW, we were again reminded that all PEDs must be turned off. This may have been because the brand new A319 we were using had been delivered without the ubiquitous no smoking cigarette signs and instead had lights that said, "Turn off all electronic devices". If the new policy was in effect, it was obvious this crew was not willing to challenge the Airbus engineers. Then, "**Eureka!**" During the standard welcome message on this current flight we were told to ignore the video message to stifle our gizmos. Indeed, we were told that they could remain "on, but in the airplane mode only". So, despite the fact that the aircraft is equipped for airborne Wi-Fi, that feature could not be turned on until reaching 10,000 feet. Laptop users were also required to keep their machines stowed along with the tray tables until after takeoff. I had my iPad stowed in the seat pocket in front of me with my awesome Bose QC-15 headphones plugged in and pumping tunes from moment of pushback. New rules notwithstanding, some of the flight attendants were seen to twitch noticeably when they passed someone with obviously flowing electrons. Old habits die hard.

To answer **Cobra's** emailed query, the weather in Dayton was, well, typical of November. We had rain and we had cold and sometimes we had rain AND cold. We were twenty minutes late out of DAY so we could be deiced...and snow is rumored to be in the forecast for this weekend. Whew! Got out of town just in time.

Despite a rigorous schedule of meetings and briefings at FFO, I was able to spend a couple of hours visiting the **NMUSAF** (formerly known as the **USAF Museum**). I, naturally, had to visit the flight test hangar to see all the unique air machines stolen from Edwards. Now I know how the Egyptians feel about the British Museum. There, I took a series of photos of the PA-48 "Enforcer" that might help Mike Glenn and his crew of aircraft restorers at the

Edwards Museum with their refurbishment of the other Enforcer in existence.

Yaw, Angle of Attack, Pitot-Static (YAPS) boom on left wing tip tank

The PA-48 was a ground attack aircraft based on the basic design of the P-51 Mustang with a turboprop engine

One of the major downfalls of the design was using gravity fall bomb racks rather than ejector racks. The aircraft was fast enough to build enough aerodynamic forces that the weapons would not fall away immediately after release, causing problems with accuracy

Then it was off to the main museum complex where I met my tour guide, **Jack "Looper" Hudson**, TPS class 82A alumnus...and NMUSAF director. He whisked me past the magnetometer checkpoint with a "he's OK" (now I'm feeling like somebody). Our first stop was the preparations for a very special and "intimate" dinner for 350 to be held tomorrow (Nov 9) in honor of the last reunion and final toast of the Doolittle Raiders. With three of the remaining four Raiders in attendance they will open the special bottle of 1898 (for Doolittle's birth year) brandy and toast with the remaining "erect" silver goblets. After this weekend the goblet collection (and empty bottle, I presume) will go on permanent display in the WWII gallery...and a chapter of American aviation history will close.

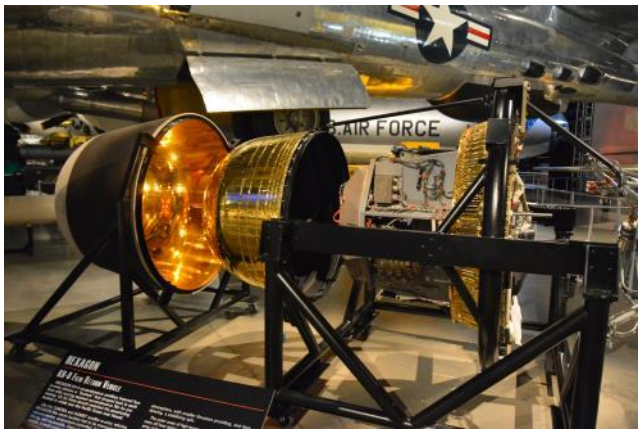
From there we walked to an exciting new exhibit under construction. Most are aware that the politically-charged wrangling over the retired Space Shuttle fleet left Ohio and the NMUSAF out in the cold. Not to be deterred, Jack obtained a forward fuselage section used for crew procedures training and is building a full-scale mockup of the fuselage and cargo bay, complete with flight-worthy Teal Ruby surveillance satellite. Visitors will be able to walk the payload bay and view the crew stations on all decks...something no other museum can claim. The exhibit will eventually be the centerpiece in the fourth hangar building to be constructed next year.

Space Shuttle Display. Some assembly required

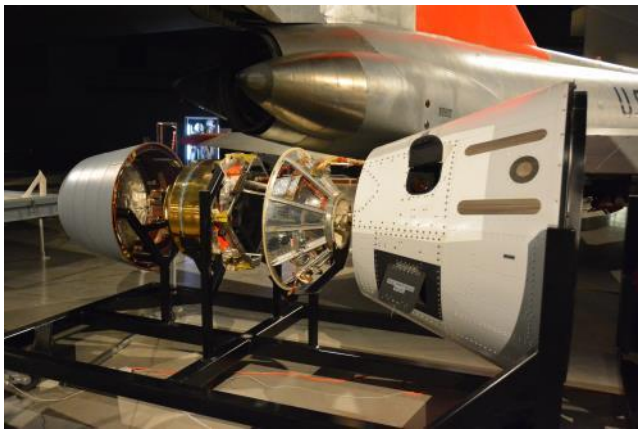
Jack also related a story of a call from his friend **Bruce Carlson**, whom we mere mortals know as General Bruce Carlson, former AFMC Commander. Carlson, now at the formerly super-secret National Reconnaissance Office was seeking to do some house cleaning and offered Jack a series of Keyhole program spy satellites that had just been downgraded from Top Secret to Unclassified. It seems the **Smithsonian NASM** had first dibs but turned them down. Having once been cleared to know of the existence of these birds, I got a perceptible chill just standing next to the hardware that served as such an important national asset.

Ending our quick tour in the space and missile hangar, I spied a recent acquisition in the form of a Defense Support Program (DSP) ICBM detection satellite. Once again, memories came flooding back of my work on this

Lt Gen (ret) Jack Hudson with the KH-9 Hexagon satellite. Yes, that locomotive sized thing is a satellite. It's no wonder it needed a Titan IIIC launch system to get to low earth orbit



KH-9 Film Return Vehicle, aka "bucket". This was plucked from the air under parachute by a C-119 Boxcar or C-130 Hercules. This system was made obsolete by the development of high resolution digital photography and real-time telemetry delivery of imagery



KH-8 Gambit III

formerly black program. As I prattled on about how I participated in the design, manufacture, and testing of this very satellite, **Looper** allowed as how I should sign up to be a docent in the museum. I said I'd welcome the

DSP satellite structural test vehicle

opportunity...as soon as he moves it to warmer climes. About the only exhibit I didn't see was an empty display case with the inscription, "Lt Col Gary Aldrich, USAF Ret - currently on loan to the Test Pilot School".

Sorry to ramble on, but that's the risk you take when I have surplus time to fill. See you all at the **Flying Dog Ranch** where we will help the next generation of USAF officers start building their memory collections.

Fly Safe and Check 6

- Gary Aldrich
Kommanding

Recent *Bearhawk* Mods

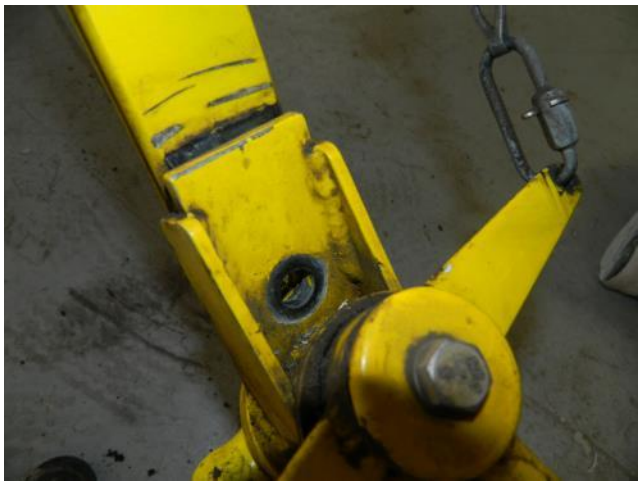
Recently I visited Three Sigma to adjust the autopilot and noted the tail dragging a few inches lower than normal, mostly because the tail wheel tire was suddenly flat.

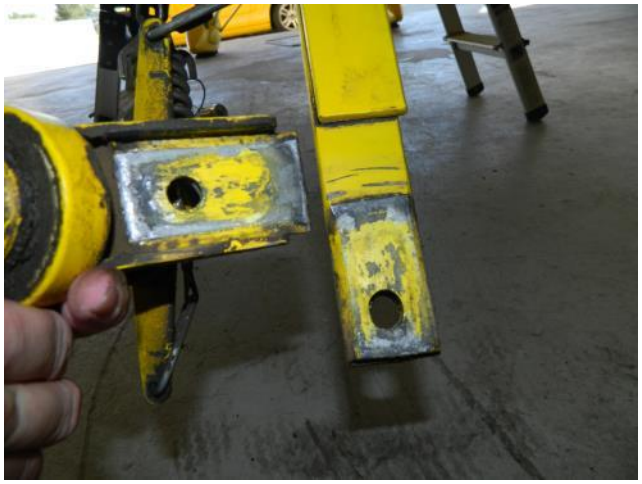
When I pulled the tail wheel off, I noticed something unusual. The tail wheel assembly was loose on the tail spring, even though the cotter pin showed that the nut had not moved on the attaching bolt. Additionally, the tail spring was loose at the front where it bolts into the fuselage. In both cases the problem was that the paint that was on the tail spring between it and other parts was eroded by the movements under load, and when that paint film was removed it left a gap between parts that made things loose. In the photos you can see where the paint was rubbed off under the washer and between the spring and tail wheel bracket.

However, the key point is that neither of these now loose bolts was apparent as long as it was under load (tail sitting on tail wheel).

I mentioned this on the Bearhawk group and three other people confirmed that they fly on rough strips and

they have to tighten up the bolts on the tail wheel spring on a regular basis. I found out that the designer Bob Barrows recommends using a locking nut instead of a castle nut on the tail spring just so you can torque it properly without needing to line anything up. He said this is important to prevent shimmy. Hmmm...I've had an occasional issue with tail wheel shimmy in the last year that I didn't have before. Interestingly, since I tightened up the bolts I haven't had any more tail wheel shimmy.





The windows in the Bearhawk are held open by latches under the wing. The original latches I made were built like those shown on the Prototype.

I was always a little concerned about this setup, since all of the loads were taken in bending on a fairly thin sheet of aluminum. I knew that one wrong pull on the window would bend the latch and then I wouldn't be able to bend it back to its original shape. Now that I think of it, I always assumed that the prototype latches were fabricated of aluminum, but they might have been steel, which might have held up better.

Well, eventually, that wrong pull happened, so I needed to do something about it. I decided to change the design to mimic one I had seen on another Bearhawk somewhere (wish I could remember which one it was). This time I used an aluminum angle and cut a slot in one side. This way there were no weak points introduced by making bends.

I alodined the new parts and was just going to install them that way because the effort of setting up a paint booth and priming and mixing up the two-part paint wasn't worth it for just two small parts. The **Kommandant** suggested that I should at least try to find a can of rattle-can spray paint ("Krylon") that was sort of close to the right color, acknowledging that the color match would not be perfect, but would look good enough from a distance.

Knowing that red looks better when applied over white, I picked up a can each of red and white. I first sprayed the angle in white and let it dry for two days. As I was getting ready to spray the red, I realized that with some simple masking, using tape I already had, I could make a red and white strip pattern. It's not really necessary, because the latch is right above the wing strut and it is almost impossible to hit your head on it. Even so, **Tuki** said she liked the idea of the red and white stripes so I masked the parts and sprayed them that way.

This past winter there were several mornings when I wanted to go fly that the air temperature had dropped below freezing, and I was concerned about causing extra wear on the engine from starting it with cold oil. Additionally I would have to burn extra fuel while idling waiting for the oil to warm up. I found out that the **Kommandant** has an oil pan heater on the **Fightin' Skywagon** that he will plug in the night before for situations like this. I asked him how he made the decision to install an oil pan heater, and he replied it was there when he bought the airplane. After all, it was previously based in Maryland.

Even so, he agreed that it adds less than one pound to the airplane (in my case that moves the cg in a favorable direction anyway) and if it made me feel better, then it was probably worthwhile. It was only $150, which in airplane terms is quite inexpensive.

The heating pad is a peel-and-stick to the bottom of the oil pan, but it requires removing the paint from the oil

pan first, and applying pressure to the pad for an extended period of time after installation. This last part was a challenge, since it was too long to hold it in place by hand, and there was a bunch of other stuff in the way. My solution was to take a 2x6 and cut it to match the shape of the pad (which was not flat), and to cut reliefs around the other obstructions. This block was then held in place with a broomstick cut to length. The fuel line fitting into the carburetor conveniently held the broomstick in place.

Pressure was applied to the broomstick using a small floor jack. Care was used to not apply too much force, stopping when the broomstick started to buckle.

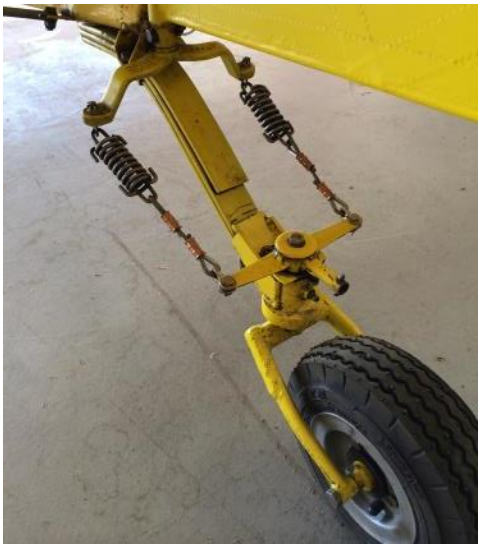
To keep the jack from rolling out of position it was placed on a 2x4 so that the wheels were off the floor. The 2x4 appears white because it was wrapped with paper from a previous use.

The heating pad has a thermostat so that it won't exceed a set temperature. This means you can leave it on overnight without overheating the oil. However, you don't want to leave it plugged in all of the time, because the warm oil will tend to evaporate the dissolved water, increasing the risk of internal rust and corrosion. Not so bad overnight, but could be bad after many days of being plugged in.

For years my tail wheel steering has had a large deadband in it. As USN Test Pilot **Ed Kolano** wrote about in the October 2013 Experimenter (www.eaa.org/experimenter), freeplay/deadband/slop in a control system is generally bad and should be minimized. It introduces a non-linearity in the control that makes it difficult to use. In my case, the deadband was so large that I wondered just how much of my steering was coming from the tail wheel and how much was coming from differential braking.

In my case, the deadband was a systemic problem in the design of the connection between the rudder and the tailwheel steering yoke. The springs were connected to the steering yoke by a short chain. Like particle physics, the chains are inherently quantized. You could only adjust the length of the chain in increments of one link. In my case, the number of links I had left too much slack, but taking one out would stretch the springs too much, taking away most of their effectiveness, not to mention being very hard to install. I couldn't just take one out on one side because that would leave me perpetually taxiing in a circle. Possibly amusing, but not very practical.

Original configuration with chain links (and some Oshkosh grass)



New configuration with cables

After much staring at the tail wheel steering system and much noodling, I knew that I needed a way to connect the springs to the steering yoke that I could control the length of the connection to a very small increment. I decided to try using control cable and Nicopress fittings, much like used on all of the control cables in the airplane. I made up the cables you see here, and they worked out very nicely, with about 1/16" of pre-load in each cable.

Was it an improvement? The first time I tried taxiing after the modification, my feet tried to use the same gains they had used for the last three years. This resulted in me almost over-controlling the airplane! Fortunately the back taxiway at Rosamond is very wide. After I dialed my gains back, I found the airplane to be significantly easier to taxi.

Tired of hearing about Bearhawks? You think that Evil Editor Zurg is playing favorites? Quite the opposite—he's desperate for material (can you tell?). Solve this problem by submitting something about your favorite airplane!

- Russ Erb

Go To Lunch, Get A Glider Flight

On 14 October, **Gary Aldrich** was looking to fly the **Fightin' Skywagon** up to KTSP to take advantage of the lower price on AvGas. Gary noticed ***PPO* Bill Irvine** was at Fox Field working on a Cessna 310. Gary invited Bill to join him on the refueling flight with the offer of lunch at Mountain Valley (L94).

After refueling the Skywagon at KTSP and Gary and Bill at L94, the duty tow pilot **Jimmy Doolittle III** suggested that Gary should take Bill up for a glider flight. Bill made the mistake of saying that he had never flown a glider, at which point **JDIII** redoubled his efforts. Sensing an easy kill, CEO of the airfield **Jane Barrett** joined in the persuasion.

Eventually **Bill** gave in to the pressure and helped Gary push out the DG-1000. After a 30 minute flight, **Gary** was heard to say that **Bill** "was a quick study on lift techniques. I think he would be easy to solo."

Still No Word From EAA Headquarters

Last month we ran this picture of **Trevor Janz**, Manager of Chapters and Eagle Flights, as seen at the Chapter Leaders Breakfast. He had told us that **Paul Poberezny** advised him to stay in touch with the chapters by reading every single newsletter. **We offered him a chance to prove to us that he does this by sending an e-mail message to Evil Editor Zurg at eez@pobox.com for publication in this newsletter**. Still, we haven't heard anything from him.

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

Nov 12: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

Nov 19: EAA Chapter 1000 Monthly Meeting, 6:30 p.m., Flying Dog Ranch, 4400 Knox Ave, Rosamond CA. (661) 609-0942

Dec 10: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

Dec 17: EAA Chapter 1000 Festivus Etc Celebration, 6:00 p.m., Kommandant's Kwarters, 42370 61st Street West, Quartz Hill CA. (661) 609-0942

Jan 14: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

Jan 21: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Feb 11: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

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

Mar 11: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

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

Apr 8: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

Apr 15: EAA Chapter 1000 Monthly Meeting, 6:30 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

May 10: Twenty Third Annual *Project Police* Airport Barbecue, Rosamond Skypark (L00), Rosamond CA. (661) 609-0942

May 13: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

Jul 28 – Aug 3: EAA AirVenture. Oshkosh WI.

To join Chapter 1000, send your name, address, EAA number, and $20 dues to: EAA Chapter 1000, Doug Dodson, 4431 Knox Ave, Rosamond CA 93560-6428. 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
C/O Russ Erb
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Rosamond CA 93560-7692
http://www.eaa1000.av.org

ADDRESS SERVICE REQUESTED

THIS MONTH'S HIGHLIGHTS:
MONTHLY MEETING 19 NOV @ FLYING DOG RANCH
KOMMANDANT KEEPS iPAD ON DURING FLIGHT
RECENT BEARHAWK MODS
IRVINE FLIES WITHOUT ENGINE

EAA™
THE SPIRIT OF AVIATION