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 *May 2000*

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:

No Third Tuesday Meeting This Month! Instead, We Expect You To Participate In:

Ninth Annual Scotty Horowitz Going-Away Fly-In--20 May 2000, Rosamond Skypark

Yes, it's that time of the year again—time for EAA Chapter 1000's big annual shindig. Rosamond Skypark will be abuzz with way cool EAAers like yourself, and you'll want to be there. This is Chapter 1000's annual big event where we invite area EAAers to come hang out with the ***Project Police***.

The events will be similar to those in past years. We're planning to have a Spot Landing Contest (0745-1100) for you to show off your airmanship skills (the line will be 100 feet beyond the displaced threshold). Only your first landing counts. Rumor has it that **Jenna Ware** may be back this year to defend her title, so you'll want to practice up beforehand. The aviator displaying the highest level of aviating proficiency will receive a handsome plaque for posting on her/his hangar wall or other favorite location.

You'll need to get your airplane washed and cleaned up nice too so you have a fighting chance in front of the most critical judges—the assembled masses. All participants will have a chance to vote for their favorite airplane in the People's Choice contest. The pilot of the most popular aircraft will receive a handsome plaque for posting on his/her hangar wall or other favorite location.

And of course there's the most important part—the imbibing and eating festivities. **George Gennuso** will be returning as the ***Project Police Number One Master Super Grillmeister (PP NO-MSG)***. You won't want to miss his culinary masterpieces.

You'll also want to ask **Doug** and **Gail Dodson** about their exciting flight in the Bahamas Air Race, currently underway at press time.

This year we're pretty sure that **Scott Horowitz** won't be showing up at his namesake event. Scott is the pilot of the Space Shuttle *Atlantis* for mission STS-101. The schedulers at NASA did their best to free him up for this important event, originally scheduling the mission to have been completed in time for him to attend. However, as things always go, delays beyond even the ***Project Police's*** control slipped the schedule to the right such that the schedule launch date at press time is 18 May. Even so, Scott knows of our tribute to his success and is expected to do a high-altitude fly-by of Rosamond Skypark in his aerospace vehicle. He'll be looking down to inspect the assembled aircraft and to cite any ***PPO***s who didn't bother to show up. No word yet if he is planning to sneak any duct tape repairs onto the International Space Station like he did on the Hubble Space Telescope. Will a Chapter 1000 patch show up in the Space Station? Who knows?

As a benefit of the Information Age, you can find almost anything on the Internet, whether it has value or not. While you can go to NASA's web site and find out technical details about the mission or Scott's life story, you can also find the individualized meal menus for each of the astronauts (Scott's are at http://spaceflight.nasa.gov/shuttle/archives/sts-101/crew/menus/menuhorowitz1.html). Don't ask me why this is important enough to post on the web. The staff at ***PPHQ*** studied Scott's menus, and noticed a couple of points of interest. Scott must really like rehydratable shrimp cocktail, since he's having it every day for lunch and dinner. Second, we noticed an obvious lack of any Chocolate Chip Cookies (C^3) on his menus. Of course, after sampling what NASA calls Astronaut Chocolate Chip Cookies a few months ago, the ***Project Police*** can understand why he would avoid them.

EAA Books On The Cheap!

EAA is running its annual half-price sale on books and videos again. The deal: 50% off. The catch: To get the discount, you have to order them through your chapter. All EAA books and videos are eligible. If you want to order something, contact **Russ Erb** (661-258-6335, erbman@compuserve.com) before 18 May 2000.

Last Month's ~~Meeting~~ Gathering

EAA Chapter 1000
Scobee Auditorium, Test Pilot School, Edwards AFB
1700, April 18, 2000
Gary Aldrich, Presiding

Yes, we're still waiting for Secretary **Bowen** to get the minutes in for the February and March meetings. Can someone talk to his boss to unload him enough for these important duties?

As for the April meeting, we had retired Flight Test Engineer and BD-4 builder **Bob Hoey** speak to us. For many years Bob has been running a self-funded research project into the stability and control of soaring birds. He has done this using bird-shaped radio controlled gliders.

Of course, there were numerous problems to be solved. Since the bird gliders have very little in the way of a conventional tail, longitudinal stability is minimal at best. As a result, initial attempts to launch the gliders using bungees (similar to winch launching) were less than successful. What to do? Well, Bob is a veteran of the X-15 program, and X-15s didn't winch launch very well either. No bird size B-52s were available, but Bob did have a friend with a conventional radio control aircraft large enough to mount the bird gliders underneath. This mother ship was used to carry the bird glider to launch altitude and drop the bird glider. As shown in the videos, for proper flight test safety, a chase dog was used for all takeoffs.

Originally, Bob used drag flaps under each wingtip for lateral directional control, much like B-2 rudders. While this worked, it was hardly representative of how birds fly.

Study of actual birds showed that part of their lateral - directional control comes from rotating their tail around a longitudinal axis. Looking from the rear, the bird's tail rotates clockwise to turn left and counter-clockwise to turn right. In order for this to work, the tail has to be uploaded (lifting) instead of downloaded like we typically fly airplanes. In order to do this, birds must be longitudinally unstable. Bob verified this through his flight test. Even so, this didn't seem to provide enough moment to turn like the birds do.

Traditional ailerons or wing warping produced adverse yaw with no vertical surface (rudder) to offset it. Study of birds showed no evidence of spoiler control. A method for lateral control with proverse yaw was needed.

Further research led to the idea that the primary feathers (the "fingers" at the wing tip) operate in the upwash of the vortex at the "tip" of the wing inboard of these feathers. Because of the geometry of the setup, increasing the angle of attack of the primary feathers created a force up and forward (proverse yaw). This was implemented on the glider with great success.

Bob has built a raven, a turkey vulture, and a sea gull so far. As the gliders are full size, Bob has been able to thermal his gliders with actual birds, and the birds don't seem to notice the difference. He has been so successful that he occasionally looses track of which bird is the glider. Commanding a momentary spin clears that up right away.

Bob's research continues. While he has been able to successfully soar with real birds, his glider is left well behind when the birds decide to leave one thermal and glide to the next. Bob suspects some sort of variable geometry where the birds reconfigure their wings to optimize for cross-country gliding which his glider is not capable of.

After the meeting, Bob was treated to dinner at the local **BK** with the ***Project Police*** continuing to ask probing questions.

- Erbman
Pseudo-Secretary

The Prez Sez…

A couple of weeks ago I undertook a flight in the Skywagon that surely ranked among my top ten flying experiences. My job took me to Colorado Springs and, since the spring weather promised to be mild, I felt it was a good mission for the 180. I had the privilege of sharing the trip with fellow chapter member and soaring god Jim Payne. The trip out was fun and uneventful, but the return was magnificent. We departed Academy Airfield (AFF) around 0830 and climbed out to the west past the majesty of Pikes Peak. There was high cirrus and light northwesterly winds and virtually none of the turbulence the area is known for. We had Montrose, CO (MTJ) in the 430, but were primarily navigating by pilotage...JP's pilotage, that is. Seems Jim has a vast amount of experience soaring among the peaks of the Rockies and he has a story about each one of them...as well as intimate knowledge of the passes and canyons through which we could safely travel without climbing into the flight levels. We passed awesome scenery of snow-capped craggy peaks, green valleys, and rushing spring streams. We were somewhat disappointed when Montrose came into view and the terrain began to flatten.

Departing MTJ, we dialed Kingman, AZ into the "color TV" and noticed that our path took us directly through the Grand Canyon National Monument. Rummaging around in my flight bag, I located my Grand Canyon VFR Aeronautical Chart and loaded the endpoints of the "Dragon Corridor" into the box. Flying over America's biggest ditch is, my friends, a "must do" aeronautical event. I'm pretty jaded about scenery and such, thinking I've been to and seen a lot of stuff...but this is, well, awesome (am I repeating myself?). Passing over the rim and watching terra firma dramatically plunge several thousand feet to the riverbed left us at a loss for words. Had it not been for the strains of John Denver playing through our headsets, the only sound would be the steady hum of the Skywagon's big Continental. In 1974 my young bride and I passed by the north rim of the Canyon on our way to California for my first Air Force assignment. I remember stopping dutifully at each roadside lookout point and taking a picture. After the first few, Anne and I agreed that it was pretty easy to get "canyon'ed out". Twenty-six years later, it was as if I had never seen such a sight. The aerial perspective, even from the mandated 10.5

Kft (MSL) altitude was not only priceless, but over much too quickly.

All too soon, the terrain took on the familiar appearance of our California desert. We arrived in the Antelope Valley around 1630 to gusty southwesterly winds (what else is new?). After tucking the Skywagon in her hangar I reflected for a moment how fortunate I was to have had the opportunity to share such a fabulous flight with a good friend and a good airplane. I also thought about the efforts to further restrict overflights of the Grand Canyon and of the continuing rise in fuel and other expenses that could make such an adventure a privilege shared only by the few and the rich. I guess that's why I continue to pay my dues to the AOPA, EAA, SSA and other aviation-oriented "alphabet groups"...so that we can continue to read newsletter articles like this one.

So, that's my story...how about somebody else from the membership? Let's hear about your favorite aviation experiences. Your newsletter editor would appreciate the filler, those still in the building stage would benefit from the incentive, and the membership in general would share in your enthusiasm for sport aviation!

Check 6 and fly safe!

- Gary Aldrich
Kommanding

New Member

The World Wide Web strikes again! Another web surfer in Utah has stumbled upon our chapter web site and shown his great intelligence by acting upon that urge to be counted as part of the infamous ***Project Police***. At least that's what we assume happened in the absence of any other evidence. **Jeff Tyler** of Cedar City Utah and his wife **Christy** sent in their check to join up with our fine organization. Jeff appears to have been an EAA member for quite some time, sporting a 5 digit EAA number. Jeff owns a Piper Tomahawk, and spends his time as a Flight Service Specialist with the FAA. Welcome to the fold, Jeff! Come down and visit us sometime!

Project Police Trainees On Tour

During the week of 16-22 April 2000, two groups of USAF Academy cadets were visiting Test Pilot School for their final project in Aero Engr 456. While not a direct part of their project, the cadets were led on a training mission on ***Project Police Tour A***. Visits included **Russ Erb's** Bearhawk, **Chris Shearer's** Acroduster II, **Howard Judd/Dave VanHoy's** Giles G-202, and **Doug Dodson's** Glasair II-S FT.

Many of the ***Project Police*** are familiar with three of these projects, but the Acroduster II was a new one. Chris and Lisa have some lovely **objets d'art** hanging in one room of their house. If I hadn't been told they were art, I would have sworn they were four beautiful wood wings, ailerons, and welded tail feathers. Out in the garage is the fuselage which has been welded up but has not been fitted with any systems. A very significant finding was that Lisa makes an incredible Chocolate Chip Cookie (C^3), clearly as good as Raven's Nest Cookies, the ***Project Police*** standard.

This is clearly a project that should be subject to inspection by the full complement of ***Project Police***. It is located on base, as is **Dave Evans'** RV-4, which has not been inspected recently. Perhaps we could tour these projects, plus see **Russ Erb's** Bearhawk wing which has skins now.

Atherton Pilot Wins Aerobatic Competition

Chandler, AZ – Norm DeWitt, a resident of Atherton, CA placed first at the ***Championships of the Americas*** aerobatic flying contest held March 26-31, 2000 in Chandler, AZ. Norm bested a field of 19 competitors to place first in the Advanced category, one of five categories in competitive aerobatics.

In competitive aerobatics, pilots display their talents and knowledge by flying a sequence of specific maneuvers. These maneuvers may be a standardized series of sequences referred to as "known sequences" that have been practiced in advance by each competitor, or routines unknown to the pilot until shortly before the competitive flight, referred to as "unknown sequences". Trained judges score each competitor on how each sequence is performed. Competitors compete for trophies, achievement awards, and national and international recognition.

For his performance, Norm was awarded a beautiful crystal trophy by the International Aerobatic Club (IAC). He is now the reigning IAC Advanced Champion of the Americas. Since this contest was internationally sanctioned by the Federation Aeronautique Internationale (FAI), he also earned a gold medal similar to the medals awarded at the Olympic Games.

Norm has been flying for more than 35 years and competing for 5 years. He owns and flies a Zivko Edge 540 monoplane that is one of the highest performance aerobatic airplanes available in the world. The plane weighs 1160 pounds and has a "souped up" engine producing 387 HP. The plane utilizes carbon fiber throughout, and is stressed to +/- 12 G's. The roll rate is 420 degrees per second. Norm also performs in air shows throughout California and Arizona.

David Munday Buys A Cassutt

Steve Wolfe and I bought a Cassutt (Formula 1 Race-plane) that had been abandoned in a warehouse. The warehouse owner wanted it gone, so we got one of those WOW deals on it. As you can see the fabric has been torn off the tail. There is some damage to the wing too. It had a Piper style pitot tube which somehow got forced through the plywood wing skin, and there are some scuffs and dings on the wings, but otherwise it looks complete less engine and instruments.

These are the kinds of grins you get when you find one of those old-plane-in-a-barn deals. Now we've got to figure out if we're ready to fly this little devil. It lands twice as fast as any taildragger I've ever flown. Anybody know where we can get a deal on an engine?

What About Fiberglass Planks?

(*This question came in from one of the members on the Bearhawk e-mail list. Bob Waldmiller was good enough to lend an answer.*)

I have been analyzing the stresses in the One Design and Bearhawk, just for my own satisfaction. In the process of laminating my doug fir spar for the 1d, I have become curious as to how one designs for composite construction. I was thinking that it would be great if there was a way to make "boards" out of glass, kevlar or carbon and build with them instead of wood which has much in the way of defects which must be worked out or around and is scarce. I have seen many books advertised but was wondering if you knew of one which approached the problem from the point of OK you follow this layup schedule with this resin and this reinforcement and your piece will have these properties. I think it is very interesting to study the engineering behind our planes. It is an adventure for me. I dropped my engineering classes when the Marine Corps told me I could fly their jets as soon as I got a degree. Any degree.

Thanks,
Archie Dunbar

The idea of building fiberglass "planks" and gluing them together is not really a new idea. One company used to manufacture a product called "spar tuff" which was essentially a premade spar cap material which could be laminated together to obtain the required thickness and integrated with the shear web to form a complete spar. The biggest "gotcha" is determining what adhesive you need to transfer the loads from the spar cap into the shear web. Also, the adhesive properties directly drive the amount of bond area required which directly drives the spar dimensions.

In general, the idea of replacing the laminated Douglas Fir with solid laminated fiberglass planks will be neither cost effective nor lightweight. To build lightweight structures using composites requires "thinking in composites". Modern high-tech composites are not the answer to every structural probem. However, for a wing spar, there are few better materials. I'd easily choose a composite spar over a wood spar any day—as I did with Excalibur.

Now how does one go about designing a composite spar. First you need to define the loads to which it will be subjected. Then you need to choose your materials and understand the limitations of those materials. Next, you need to determine the dimensions of every component of the spar. Don't forget the necessary hardpoint(s) for attaching the spar the airplane. Finally, go build it and test it to your satisfaction.

If you lack fundamental knowledge of structural engineering, then it is best to hire someone who does before building anything. Alternately, you could learn what you need to know on your own. For the basics on composite aircraft design and structural analysis in general, refer to publications such as "Practical Stress Analysis for Design Engineers" (I have not read this book) or "Composite Basics" by Andy Marshall (good primer on the subject). Both are available from Aircraft Spruce & Specialty. Unfortunately, there are no "cook-book" recipes to follow because different airplanes require slightly different flavors of spar design.

Good Luck.

- Bob Waldmiller

SoCal VAF/Det 11 Inspect Boredom Fighter

A detachment of 7 RV's from the Southern California Wing of Van's Air Force flew to Half Moon Bay for the April 30 Pacific Coast Dream Machines Event. Little did anyone know that it was a front for two ***Project Police*** members to do an incognito inspection of the Boredom Fighter that went in a LOW SPEED dive toward the deck to get away from its escort RV. You read about this adventure in the April newsletter.

The lead aircraft of SoCAL RVs was given parking right next to **Ed Dutreaux's** RV-4. Ed had his aircraft ID card with his EAA Chapter 1000 logo displayed. Gary pulled out his EAA Chapter 1000 placard and placed it on his airplane. Two EAA 1000 members are now parked right next to each other and form an incognito ***Project Police Tactical Assault Force***. Ed has his digital camera and Gary recruits a SoCAL RVer to take photos of them as they INSPECT the Boredom Fighter. There was no sign identifying the Boredom Fighter as an EAA 1000 aircraft and there were no C^3 (Chocolate Chip Cookies) to bribe the ***Project Police***. Ed and Gary looked over the aircraft and then they both found it. Both were pointing at it when Walt the recruited photographer came over to take the photo. What did the ***Project Police*** find?

- Gary Sobek

PS:

I will be in Sunnyvale doing some work in late May or early June for about 5 weeks. I am not sure if I will be bringing the RV. My employer is short people in Sunnyvale and they would like me to relocate there. If I could get a hangar to share to keep my airplane in, I would not hesitate to go. If I relocate to Sunnyvale for 18-36 months, I think the Bay Area would become the largest detachment of EAA 1000 members.

The most interesting thing at Half Moon Bay Dream Machines, other than the obligatory ***Project Police*** photo in front of the BF, was the arrival of the Vickers Vimy which was in the pattern when I arrived repeating over and over "No formation with the Vimy." This was a odd request because the only aircraft on the field that was slow enough to hold formation with the Vimy was tied down on the ground, **Jim Piavis's** Boredom Fighter (you know, Jim, you're not the only member of Det. 11 that can send a e-mail to **Russ Erb**. Now who looks dumber?)

- Ed Dutreaux
EAA Chap 1000 Det. 11
RV-N444ED
President EAA Chapter 20

How Big Is Your Horse?

From Ray Prouty's *Practical Helicopter Aerodynamics*:

"Our horsepower unit comes from old British coal-mining technology. A 'standard' horse could lift 100 pounds out of a vertical shaft while walking away at about four mph or 330 fpm."

Web Site Update

Checking the ol' hit counter on 7 May 00 showed it standing at **42643** for a hit rate of 36 hits/day for the last month.

An e-mail recently received here at ***PPHQ***: "I live in central New Jersey, so I don't think your Project Police will raid my project, being that your chapter is about as far away as it could be. I wish they would raid my shop, because I am rebuilding, more like constructing, a 1947 Cessna 140. I am at the point where I am putting the horizontal stab back together and 'single-pilot riveting' just doesn't cut it. You must have some terrific members, based on what I read on your site. Keep up the good work. Anybody in your chapter working on certificated aircraft, as opposed to homebuilt? I'd love to correspond. Thanks again for the spirit your chapter exudes. Pete Murphy, 140flyer@geocities.com"

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

May 9: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., Edwards AFB. Test Pilot School, MOL Room (661) 609-0942

May13: Young Eagles Rally, Fox Field, Lancaster, 661-822-0462

May 16: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School (Bldg 1864), Scobee Auditorium. (661) 609-0942

May 20: Ninth Annual Scotty Horowitz Going Away Fly-In, Rosamond Skypark (L00), Rosamond CA.

Jun 7: EAA Chapter 49 Monthly Meeting, 7:30 p.m., Sunnydale School. 1233 W. Ave. J-8, Lancaster, CA. (661) 949-7214

Jun 13: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., Edwards AFB. Test Pilot School, MOL Room (661) 609-0942

Jun 17: EAA Chapters 1000/49 Young Eagles Rally, Tehachapi CA. (661) 822-0462

Jun 20: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School (Bldg 1864), Scobee Auditorium. (661) 609-0942

Jul 15: EAA Chapters 1000/49 Young Eagles Rally, General William J. Fox Field, Lancaster CA. (661) 822-0462

Jul 11: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., Edwards AFB. Test Pilot School, MOL Room (661) 609-0942

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

For Sale:

Sonerai IIL project. Fuselage and wings 95% complete. Modified for A65 engine. Engine torn down for overhaul but complete with a great many spare engine parts. Includes instruments. Hydraulic brakes. All excellent work. Call Fletch Burns 760-373-3779

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.

Contact our officers by e-mail:
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Inputs for the newsletter or any comments can be sent to Russ Erb, 661-258-6335, by e-mail to erbman@compuserve.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!*

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MUROC EAA CHAPTER 1000 NEWSLETTER
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http://www.eaa1000.av.org

ADDRESS CORRECTION REQUESTED

THIS MONTH'S HIGHLIGHTS:
NINTH ANNUAL FLY-IN 20 MAY AT L00
NO MEETING AT TPS
BOREDOM FIGHTER INSPECTION
MUNDAY GETS CASSUTT IN BARN