



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>

February 2005

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:



What Comes After Nemesis?

Jon and Tricia Sharp
Tuesday, 15 February 2005
1730 hrs (5:30 PM Civilian Time)
Jon and Tricia Sharp's Hangar
Mojave Airport

Hello again, guess what? It's already time for another exciting Chapter 1000 meeting. Oh, the title? Well, you're probably thinking second place, but not in this case. We're talking about Nemesis NXT. That's right, we're talking about a field trip here, so you might want to cinch down the chin strap on your propeller beanie **Waldo** because we're heading over to Mojave tonight to visit with **Jon Sharp** and his wife **Tricia**. After some juggling of schedules, Tricia has made arrangements for us to meet them at their hangar. We will get to see the new Nemesis NXT and the tooling that it takes to create the latest racing/sport plane. As you know, Jon, in addition to racing the new plane, is also creating kits of the Nemesis NXT that you or I can purchase. Jon has devised a unique system of matching or indexing the parts that will greatly reduce the construction time. I'm not sure how it works, but I'm sure we'll find out when we get there.

Ok, Ok, calm down, and stop jumping up and down hitting each other. **Carefully read the next paragraph.**

First things first. **DO NOT** come to the TPS auditorium for this meeting. The meeting is **NOT AT TPS**; it is at Mojave Airport. We will meet at the gate near the T-hangars at the west side of the airport (Roper (?)

Pay Your Dues! Now! This Means You!

(If you have already paid your dues, please disregard this notice)



Send your cash, check, money order, or other legally negotiable instrument to any chapter officer, or pay online

by **PayPal** through

the [EAA Chapter 1000 web site](#).

Do it now and avoid the embarrassment of appearing on the **Dues Delinquent** list next month!

Street). Note the time is a half hour later than usual, so you don't need to use the hyperdrive to get there. If you show up at the TPS auditorium no one will be there except the other members that did not read down this far.

After wiping the drool off of Nemesis NXT, we may just have an unscheduled **Project Police** investigation of **Opus's F1 Rocket**, which is currently sitting in a Mojave hangar sans engine display waiting to fly.

As usual, after the meeting we will wine and dine our presenters at a restaurant of the Kommandant's choosing. So in conclusion, all I can say is, quoting Gracie, "don't miss it if you possibly can".

- **George "Knife" Gennuso**
 Vice Kommandant



Last Month's Meeting

EAA Chapter 1000

Scobee Auditorium

USAF Test Pilot School, Edwards AFB CA

18 January 2005

George Gennuso, Presiding

The January meeting was held at the Edwards AFB Test Pilot School auditorium. **Kommandant Aldrich** was otherwise gainfully occupied (*having gone to "The Best Little Whorehouse In Texas"*) and so was not in attendance, nor was he present. Your reporter was also absent but was able to provide you with these minutes through the courtesy of **Russ Erb** videotaping the meeting. So, "This review refers to the DVD version" just like you see on Amazon.com.

Vice Kommandant George "Knife" Gennuso served ably as the host and reported that the chapter "free dues" policy would be continued in 2005. Just write your name on a \$20 bill and give it to the treasurer so as to keep your name "on the books".

The Knife introduced the guest speaker, **Mr. John Perry**, who provided an outstanding account of NASA flight simulation in the 60's and 70's. John arrived in Lancaster on August 30, 1959 by train (being afraid to fly) to begin work with NASA Dryden as an Aeronautical Research Engineer, a position he took to avoid a career in teaching which his college professors were encouraging him to pursue. John had a degree in math at the age of 19, and his first assignment was to "simulate orbital rendezvous". This was followed by the task to simulate supersonic cruise (pre SST days) using analog computers (an archaic device which precedes even the 8 track tape player). John's third assignment was as the simulation project engineer on the X-15 program where he spent six and a half years before the program ended. John discussed working with contemporaries **Joe Walker, Joe Engle, Pete Knight, Jack McKay** and **Neil Armstrong**.

John provided a unique perspective on pre-digital simulation techniques, revealing a lot "strange stuff" (his words) including Servo Resolvers, Diode Function Generators, and my favorite, the "BDBF" or "Base Drag Booger Factor." He recalled his excitement about the introduction of the 1 megahertz computer which had "unbelievable speed" and allowed the start of digital simulation.

After his stint on the X-15, John "went airborne", flying aboard the **C-140 General Purpose Airborne Simulator (GPAS)**, a Lockheed Jetstar configured with analog flight computers to allow simulation of a variety of aircraft.

In 1981, John left NASA after 22 years to pursue a career as a private consultant. After 23 years, he retired, but keeps his hand in "helping people make informed choices in how they manage their work lives". John is the founder and president of Human Productivity Systems, an independent consultant who specializes in assessing, harnessing, and focusing human energy.

The Chapter would like to thank John for taking the time to share a retrospective on being with NASA during a time he described as "exciting and energizing". John was

presented with a Chapter 1000 patch and treated to a "supersize" dinner at the Edwards BK lounge, the highest tribute that we can pay a guest speaker.

I also have to report that **Leigh Kelly** brought 2 guests to the meeting, including **Lyn McNeely**, an Air Force FTE of the female persuasion, call sign "**Sweet Cheeks**". No, really. No kidding. I swear I am not making this stuff up.

- **Kent "Cobra" Troxel**
Secretary

Kommandant's Korner

Time for recounting another aviation adventure! This one starts last Monday at 0500 with a drive to the airport. This time, though, I turned south on



61st Street instead of north...and the seven minute ride to WJF was 175 minutes to LAX. After crawling along in the dark with several thousand other commuters past the clearing accident in Agua Dulce, the "merge from hell" at the 5, and the gridlock in the Sepulveda pass; I tossed the keys to the Enterprise guy and sprinted for the van. The United counter was, amazingly, nearly devoid of customers and I bypassed the Disneyland-esque maze to approach the agent. He informed me that, sadly, I was 9 minutes beyond the "baggage closeout" window and was declared a no-show for my flight. After digesting this info, he allowed as how he could book me on the next flight to Chicago/O'hare (ORD), leaving in only 1.5 hours and indicated that I could connect with a later flight to my final destination of Dayton (DAY). Naturally, with my new-found surplus of time, the security screening process took only minutes and I found myself sitting at the gate with nothing to do but drink my Starbucks and wait for boarding.

The flight to ORD was uneventful and, after another hour or so layover I stepped onto a BaE-146 commuter to DAY. The weather in Dayton was MVFR with 4 miles in mist and the pilot (who looked to be all of 12 years old) made a passable approach and landing. I slipped the key into my room just outside Wright-Patterson AFB after a 20 minute car ride about 2200 hours local. Elapsed travel time, door-to-door: 14 hours.



Fast forward through 3 days of stimulating (?) meetings, light snow flurries, and temperatures hovering around freezing and I'm heading back to DAY for the return flight. I departed my last meeting about 1100 and was able to score an earlier departure (standby, of course). Thus, I was quickly (relatively speaking) winging my way back to the warmth of SOCAL. My luck held through ORD once more and we gently kissed runway 25L at LAX at 1650L...almost a half hour early. As I stepped out of

baggage claim, the Avis van was waiting...what luck! By 1800 I was back in a rental car and merging onto the 405 once more. Of course, all those folks that were trying so desperately to get to Los Angeles with me on Monday, were also trying to escape the place on Thursday. This resulted in pulling into my garage at 2150L. Elapsed travel time for the return: 13+50. Total transportation costs (rental cars plus airline) came to \$550.

Just for grins, I pulled up FliteStar and ran the numbers for the Skywagon. Turns out, it would take 13.5 hours each way. This could probably be done in one long, or two comfortable days with three legs per day. Fuel costs would run about \$835, but would be offset by the cost of the rental car expense to and from LAX. Thus, total cost would be comparable to the airline route...even though I was alone in the airplane.

So, you say, why didn't I launch the Skywagon? Well, the big iron still holds a trump card for trips over half the country or more. As I proved last month on my Texas trip, winter weather adds just enough schedule risk to light aircraft travel that United got the nod for the long trip. Even though the weather patterns across most of the route were benign, I had to conclude that the airline could get me there with much more certainty to discharge my required duties. Had this trip been scheduled in the milder Spring weather...well that might have been another story.

The point of this whole story (I'm sure you're wondering) is that one has to choose the right tool for the job. As much of a proponent of general aviation as I am, I had to admit that the smart travel choice was the "friendly skies" instead of the Fightin' Skywagon. I sacrificed the fun and challenge of self-avigation for the ignominy of TSA, drab air terminals, and cattle-car treatment. However, I still consider myself to be one of the fortunate people who has a choice of "tools" when it comes to air travel. My experiences this last week have ensured that the next trip in N2705K will be even sweeter by comparison. For that, I thank the airline industry...

Fly safe, and check 6

- Gary Aldrich
Kommanding

N115VS Moves To Mojave Airport

Flush with the excitement of the **Tournament of Roses Parade**, **PPO Vince Sei** conned some of his friends to participate in a parade of his own. The objective of this 2 January 2005 parade was to move his **F1 Rocket N115VS** to his newly rented hangar at Mojave Airport.

Vince had reserved a trailer large enough to transport the big pieces of the airplane. However, the rocket scientist at the rental center refused to rent it to him because his truck was not large enough to pull a 10,000 pound load. Vince tried the rational thought that the load he would be pulling would only be about 1000 pounds, but the von Braun wannabee reasoned that because the trailer was rated for 10,000 pounds, the truck had to be rated for 10,000 pounds. However, he was quite willing to rent to him a large stake bed truck, much larger than anything that Vince had ever driven, with no training required at all! If

you can find the logic in this story, please tell us because we certainly can't!

One windfall benefit of this result was that the truck had a lift gate on the back. However, it was short enough that the engine would smack the truck before the main gear were on the lift. A quick trip to the Aviation Support Section at Home Depot netted a piece of plywood to attach to the gate to extend its reach. The main gear were lifted up with the lift gate, and the tail was wrestled on board using the Armstrong lift.

One very slow trip to Mojave by the back roads later and the fuselage was in place, followed by another trip to move the wings. Assembly of the really big pieces followed. At press time, N115VS is only short an engine monitor display and a DAR signoff before that secret first flight date. Watch this space for future updates.



Dave Vanhoy noodles over the force balance of the plywood lift extension attachment, while Randy Kelly drops by to insure that this group has adequate supervision. Meanwhile, Vince tries to show them the size of the burrito he ate while back in Albuquerque



Nosing up to the lift



Larry Pratt steadies the nose after Vince screws in the chock to keep the airplane from backing up, just in case it had second thoughts



Vince, Dave, and Larry after unloading at Mojave. Steve Cronk is the guy you see behind the camera taking this picture (and all the others)



Dave and Larry tie down the fuselage while Vince is nowhere to be seen. He's a regular Tom Sawyer.



Summary of all of the pictures that Vince submitted showing the wing movement



All lashed up and some place to go



In the hangar with the wings on



Another gratuitous picture to fill up space on the page



Last picture in this series

- Erbman

Ever Wonder Why The A-4 Rudder Looks Like It Does?



Photo-1 Heineman's Hot Rod (Douglas A-4)
<http://www.paxmuseum.com/a4/a4.htm>.

Just about everyone recognizes the A-4 as Heineman's Hot Rod but have you ever wondered why the rudder construction looks like it lost its skin? It is possible that all of you know why the Douglas A-4 rudder has such a unique structural and aerodynamic design. But it is still fascinating.

Photo-2 shows the unique design of the A-4 rudder. I don't know whether I heard the story when I was at Edwards AFB ('54-'56) or if I read it in Ed Heineman's autobiography (which I can't locate in my mess).



Photo-2 The A-4 Unique Rudder Design
(Toby van Esselstyn)

Specifically, I remember that the original design of the rudder had flutter. I was hoping for confirmation and possibly more detail from other sources. At the Naval Air Test Center (at NAS Patuxent River), **Dean Carico**, **Tom Briggs** and **Toby van Esselstyn** talked to personnel and investigated the Flight Test Reports and could not find any reference to rudder flutter on the A-4.

I believe the flutter occurred on the first contractor's flights before going to Pax River. Remember this was circa 1954 and operational aircraft were operating in the higher transonic region. Flutter calculations were imprecise.

It was known that flutter could be caused by separation and re-attaching of the boundary layer. It was also known at this time that shock waves could cause flutter by moving non-uniformly on both sides of a surface. The point of separation of the boundary layer or position of a shockwave could be fixed by a discontinuity of the surface.

Apparently, the original structural design of the rudder had a center plate with ribs attached and then skin over the ribs as in normal airfoil construction.

Also, I believe that, as Photo-3 shows, the Skyhawk's rudder was already thicker at its leading edge than the aft of the vertical fin. This leading edge design compensates for boundary layer thickness effects and was standard on many aircraft to improve control response/effectiveness.

So when early flight tests showed flutter in the rudder, Ed Heineman directed that the outer skin of the rudder be taken off to force the shockwaves to attach aft of the spar. This eliminated the flutter.

The ribs were probably re-designed to their presently more pleasing appearance as stiffeners.



Photo-3 Note Increase Thickness At Rudder Leading Edge (Toby van Esselstyn)

There was a question raised by Russ Erb when he sent me a picture of the rudder on an FJ-4B. Was the A-4 the first aircraft to use a discontinuity in the rudder surface to eliminate rudder flutter?

Much of the data below is from <http://home.att.net/~jbaugher1/fj fury.html> -

The North American FJ-2 was the Navy's first swept wing aircraft and was never really suitable for carrier operations. Reference 1 remarks, "**In addition, there was a rather annoying rudder "buzz" during transonic flight.**" This was with a 6000 pound static thrust (lb st) J47 engine.



Photo-4 Rich Sugden's FJ-4B With "Splitter" Rudder (Russ Erb)



Photo-5 FJ-4B at Oshkosh 2003 (Buck Wyndham)

According to **Bill Hardman** at the Naval Air Museum in Pensacola, "*The FJ-2s in the reserve squadrons were changed to the splitter type rudder at some point. Our available technical manuals do not address the reasoning or timing for changing the rudder - they only describe the two types.*" Probably the reserve squadrons' rudder changes came for safety of flight after the FJ-3 with the additional thrust demonstrated definite rudder flutter in the transonic region.

The first production FJ-3 (Bu No 135774) rolled out of the Columbus factory and flew for the first time on December 11, 1953. The engine was the 7650 lb st Wright J65-W-4. This engine with the increased thrust (7650 vs 6000) provided a maximum speed of 681 mph (0.91 Mach) at sea level, well into the transonic region.

By the standards of the day, the FJ-3 went through its test program with relatively few problems being uncovered.

The FJ-3 started with the standard rudder. **Bill Hardman** found, "Photos indicate that at some point in the FJ-3s lifespan they were changed to the splitter type - similar to the type used on the A4 series after the A4D-1/A4A."

The XA4D first flew on 22 June, 1954, six months after the first flight of the FJ-3.

The first FJ-4 (139279) took off on its maiden flight on October 28, 1954. All FJ-4 aircraft used the splitter type rudder.

My conclusion is that the rudder design on the A-4 and FJ-3 essentially happened simultaneously. Like so many things in the aircraft industry, when one company found a solution, everyone started using it. I prefer to believe Ed Heineman with his innovative spirit was the first.

The Planes in the Photos

The photos -2, -3 were provided by **Toby van Esselstyn**, Director of Patuxent River Naval Air Museum. The photos show the NA-4M Skyhawk on display in the museum's outdoor flightline. The NA-4M designation indicates that the Skyhawk was used as a test and evaluation aircraft; originally manufactured as an A-4F model, it was converted to serve with the Naval Air Test Center (NATC) at NAS Patuxent River. For additional

information, refer to this aircraft's profile on our website at: <http://www.paxmuseum.com/a4/a4.htm>.

Photo-4 was taken by Russ Erb at Airventure 2004 of The FJ-4B owned by Rich Sugden. Photo-5 was taken of the same aircraft at Airventure 2003 by Buck Wyndham.

Much info on FJ-1, -2,-3, -4 North American Fury's <http://home.att.net/~jbaugher1/fjfury.html>

Thanks to:

- Toby van Esselstyn, Director, Patuxent River Naval Air Museum, 301-863-7418
- Dean Carico, NAVAIR (NMCI)
- Tom Briggs, President, Patuxent River Chapter, SFTE
- Bill Hardman, Naval Air Museum, Pensacola

- Lee H. Erb

EAA Chapter 1000 Det 5, Arlington, TX

EAA's Aviation Services

*(This article was sent to **Project Police HQ** with the request that it be printed in the next newsletter cycle.)*

EAA members are one call, email or letter away from a wide range of technical aviation services available from the Aviation Services Department at EAA. First and foremost, the Aviation Services Team is responsible for answering member technical inquiries relating to pilot and aircraft issues. This one-on-one consulting covers everything from "How do I register my homebuilt?" to "What's involved in the A&P exam" to "How do I convert my ultralight for the new sport pilot rule?" and more.

Experienced pilots, aircraft owners, homebuilders, ultralighters and sport pilot specialists staff the department. Their personal and professional experience enable them to field just about any technical aviation question that comes their way. And if they can't answer your question right away, they'll do the research needed to help guide you to the right resource or solution. EAA's in-house library is an additional resource the Aviation Services team counts on for information and the library is also available to members visiting the Oshkosh headquarters offices.

The Aviation Services Department supplies a great deal of the technical information found on the Members Only portion of EAA's website at www.eaa.org. The Homebuilders Headquarters section on the site provides a wealth of information on building, maintaining and flying an experimental amateur built aircraft. A significant amount of the content on EAA's Sport Pilot website page is also developed by the Aviation Services team.

Two of the most popular "hands on" offerings from the Aviation Services Department are the Technical Counselor and Flight Advisor programs. There's a network of over 1,000 EAA members across the US who are registered EAA Technical Counselors that will come to your homebuilding location to provide in-progress inspection of your project. The Flight Advisor program has several hundred EAA members who will provide advice and assistance on taking that first flight in your new homebuilt aircraft.

FAA Medical assistance is one of the individual offerings also available from the department. If a member

needs assistance receiving a special issuance from the FAA, Aviation Services personnel will track the application all the through the process until approval to ensure that nothing derails your application. In addition, we have a network of doctors that are AMEs and EAA members who volunteer their services to help other members retain or regain their medical.

For more information on your EAA Technical Services offerings please call 1-800 -EAA-INFO. They're ready for your questions!

Project Police Aircraft Spotters Quiz

Way back in November 2004, **Evil Editor Zurg** left you in the quandary of pondering the question submitted by **PPO Lee Erb**:

"Who was the first person to receive a Masters Degree in aviation and aerodynamics in the United States?"

Of course, the answer was "**Nobody**", because no school known to us teaches courses in "**aerodynamics**", which managed to slip by our copy editor. Considering what we pay her, we're not surprised.

However, **PPO Francis X. Gentile** decided to answer "What the **PPO** meant to ask..." and submitted the following reply to **Evil Editor Zurg**:

"Dear Mr. Evil, (*Zurg just loves it when you're so formal...*)

As I recall, **Grover Loening** claims to have gotten the first Masters degree in aviation and Aerodynamics at ?MIT?

However this claim was made by himself, in a book on his amphibians which is not near me now, He also claimed to be quite the bon-vivant. Hence possible wind bag.

Since the meeting this month is outside the base I may be able to make it, and if so will bring the book, and some show and tell about solving all of aviations problems in case there is space and time. Francis"

See also:

<http://www.centennialofflight.gov/essay/Aerospace/earlyU.S/Aero1.htm>

<http://www.allstar.fiu.edu/aero/loening.htm>

<http://www.aviationonlongisland.com/innovators/ppl.htm>

http://www.wpafb.af.mil/museum/early_years/ey8.htm

http://www.firstflight.org/shrine/grover_loening.cfm

<http://www.netpci.com/~eldorado/gallery-asian/army-air-corps/factsheet-army-air-corps.htm>

Web Site Update

As of 6 February 2005, the hit counter stood at **96164**, for a hit rate of about 22 hits/day for the last month.



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

Feb 15: EAA Chapter 1000 Monthly Meeting, 5:30 p.m., Mojave Airport, Jon Sharp's Hangar. (661) 609-0942

Mar 1: EAA Chapter 49 Monthly Meeting, 7:30 p.m., General William J. Fox Field, Lancaster, CA. (661) 948-0646

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

Mar 15: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Apr 5: EAA Chapter 49 Monthly Meeting, 7:30 p.m., General William J. Fox Field, Lancaster, CA. (661) 948-0646

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

Apr 19: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

May 3: EAA Chapter 49 Monthly Meeting, 7:30 p.m., General William J. Fox Field, Lancaster, CA. (661) 948-0646

May 17: NO EAA Chapter 1000 Monthly Meeting, go to Fly-In instead

May 21: Fourteenth Annual Scotty Horowitz Going Away Fly-In, Rosamond Skypark (L00), Rosamond CA. (661) 256-3806

Jun 7: EAA Chapter 49 Monthly Meeting, 7:30 p.m., General William J. Fox Field, Lancaster, CA. (661) 948-0646

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

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

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

Jul 19: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

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 CORRECTION REQUESTED

THIS MONTH'S HIGHLIGHTS:

REGULAR MEETING 15 FEB IN MOJAVE

F1 ROCKET TO MOJAVE

A-4 RUDDER DESIGN

MYSTERY MAN REVEALED



The Leader In Recreational Aviation