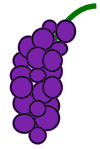


# THE GRAPEVINE



EAA CHAPTER 663 Livermore, California

Vol. XXIV, No. 11, November, 2004

There is a very fine line between "hobby" and "mental illness."

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## PROGRAM

Our November meeting will take place at 7:30 P.M. on the 4th of November in the Terminal Building at the Livermore Airport. Our program for the evening will be a presentation by Barry Weber on what he saw and shot at AIRVENTURE 2004--a slide show to blow your mind!

### MINUTES: GENERAL MEETING EAA CHAPTER 663, 10/7/04, 7:31 PM LVK TERMINAL BUILDING

Chapter president Ralph Cloud called the meeting to order.

Guest Don Linsey from EAA Chapter 62 introduced himself.

Ralph announced the first flight of Mark Summers' Q2/200. Mark was not present for comment, but we congratulated him anyway.

Minutes for the September meetings were ap-

proved as printed in "The Grapevine".

Business: The Airport Open House was a success. Several chapter airplanes were on display, and over 80 Young Eagles signed up.

The October 2<sup>nd</sup> barbecue was well attended by old and new members enjoying the last of the warm weather.

The annual dinner will tentatively be January 29<sup>th</sup> at the Alamo Women's Club. Food will be provided by the caterer used last year. A speaker or program has yet to be determined, any suggestions?

Bob Cowan set the last Young Eagles rally of the year for October 23<sup>rd</sup>. Bob made a request for volunteer pilots and a replacement for Young Eagles coordinator.

Another replacement: Roger Hansen is looking for someone to take over the chapter web site. Any takers contact Roger.

Announcements: Next board of directors meeting will be 10/21, 7:30 at Ralph's place. The Golden West Fly In will be June 3-5, 2005.

Member notes: Scott Alair gave a brief account of turning in the fastest speed for the 100 mile race held at the Lancair home coming on Labor Day weekend.

Break and then Program:

Bill Jepson introduced Art Shulenberger president and CEO of Innovation Engineering, Inc. who gave a presentation on a Variable Compression Axial Piston (VCAP) engine. He showed two models that demonstrated the operation of the concept. While some of the parts require unusual bearings with three degrees of freedom, the de-

sign has the potential for compact smooth efficient power. The company seems to be living up to their name.

Meeting adjourned for pie.

**MINUTES: BOARD OF DIRECTORS MEETING, EAA CHAPTER 663, 10/21/04 7:45 PM AT RALPH'S PLACE.**

Members with the initials RC, GT, BC, EH, BJ, BF, and BC were present.

Treasurer Sharon Constant was not present but reported to Ralph that the treasury stood at about \$2400.

The chapter trailer was the first topic. Options for improving the current trailer were discussed. New lighter duty axles that would provide a smoother rider would cost about \$350 each. A large double axle snow mobile trailer that may be available for about \$1200 has been located but it needs work. A similar new custom built trailer would cost \$2800+. The current trailer may have more value as a vehicle hauler for which it was designed. It could be sold to provide funds for a more suitable trailer. No decisions were made.

January dinner is set for 1/29/05 at the Alamo Women's Club and the caterer is confirmed. A speaker or program is still to be decided.

Bob Cowan is still looking for pilots for the Saturday Young Eagle rally and his own replacement as coordinator of the chapter's program.

Bill Jepson with help from Greg Triplett confirmed Barry Weber for the Oshkosh slide show for November's program.

Ralph mentioned the need for a new web master for the chapter.

Meeting adjourned for pie.

Respectfully submitted,  
Bruce Cruikshank Secretary

## **NO, I THOUGHT YOU DID THE PREFLIGHT**

It seems two men recently decided to go for a joy ride in a Beech Baron 58. According to the NTSB, several problems arose, though. First, it didn't belong to them. Second, the pilot had previously had his license revoked, so neither had a valid certificate. Third, it seems they both had been drinking.

According to the NTSB, the ensuing takeoff was anything but uneventful, with the twin apparently using the full 7,198-foot length of Runway 17L at Oklahoma City's Wiley Post Airport. It then continued 600 to 800 feet beyond the departure end, where the Baron struck the localizer antenna. Undaunted, the now-bent bird blasted through the perimeter fence, then across a ditch and a road, finally coming to rest some 50 feet beyond. Subsequent investigation revealed that the nose landing gear and the main landing gear collapsed, and the leading edges of both wings were damaged. No surprises there. Then a fourth problem was discovered: the elevator was missing. It seems the owner was having the airplane refurbished, and the elevator had been removed for maintenance.

## **WHAT'S HOLDING YOUR PROP ON?**

From Saber Mfg:

I stock a bolt which is not aircraft-certified. It has superior toughness and ductility compared to the standard AN aircraft bolt. It is machined to close tolerance, and heat treated under strict control so that its high tensile strength does not result in brittleness. AN bolt tensile strength is 125 kips and our bolts are 180 kips. Over 12,000 of these have been in use on homebuilts for the past 9 years with perfect safety record. Heads are single-drilled unless not required by your application.

Most importantly, these bolts have shorter grip and LONGER THREAD. Both the engine bolts and the prop bolts have extra-long thread, which provides much greater safety margin against bottoming out the threads.

As you re-torque your wooden PROPELLER over time, you may use up more and more of the available thread, and risk bottoming out the threads. This is critical, so you don't lose your bolt torque and your grip between extension face and prop face.

Also, builders often don't realize that their particular model of ENGINE has lugs installed which have unusually long thread length, and they bottom out their bolt threads unknowingly, and have no gripping of extension face to engine face.

3/8 bolt has 1.2" of thread. Lengths I stock are: 1.5", 1.75", 2", 2.25", 2.5", 2.75", 3", 4.5", 5", 5.5", 6", 7"

7/16 bolt has 1.3" of thread. Lengths I stock are: 2", 2.25", 2.75", 3", 5", 5.5", 6", 7"

1/2 bolt has 1.4" of thread. Lengths I stock are: 2", 2.25", 2.75", 3", 3.25", 4", 5", 5.5", 6", 6.5", 7"

Extension-to-engine bolts 3/8, 7/16, and 1/2, up through 2.25" length: cost \$30 per set of 6. Standard AN aircraft washers will be included with your engine bolts.

Prop-to-extension bolts 3/8, 7/16 and 1/2, up through 6" length: cost \$48 per set of 6. Included will be extra thick and hardened washers, specially designed to prevent cupping and provide consistent clamp load.

All 6.5" and 7" length bolts cost \$96 per set of 6. Included will be extra thick and hardened washers, especially designed to prevent cupping and provide consistent clamp load.

If required by for your application, you will be supplied with all-metal prevailing locking nuts - cost \$1 each.

For lengths not listed above, please inquire. Exten-to-engine bolts are available in 1/4" increments.

Prop-to-extn bolts are available in 1/2" increments up through 7" length.

## **TRADE- SHARE-A-PLANE**

I'm a new member of the chapter. I recently purchased Dave Dent's Long EZ and am looking to set up a partnership with the airplane. I was wondering if there's a chance to put in a blurb/ad in the newsletter advertising that I'm searching for a partner. I'm really enjoying the heck out of this machine.

Thanks,  
Mark Fridell

## **HIGHWAY IN THE SKY**

I had the opportunity last week to fly as a test subject (pilot) in a NASA flight experiment to determine if pilots could fly precision approaches better with EFIS and Highway In The Sky.

The short answer is, yes I can! The experiment is conducted in a Piper Aztec twin. The left seat is outfitted with the traditional round dials and the right seat is outfitted with an experimental PFD. The center stack has a CNX 80 and MX 20. The PFD has the usual EFIS presentation, including attitude, horizon, airspeed tape on the left side, altitude tapes on the right side, and magnetic heading along the bottom. It had grayscale terrain mapping too. But the real deal was the Highway In the Sky. I've seen HITS presented as predictor boxes that you fly through. This particular evaluation had the HITS presented as a flight director box (where the navigation wanted you to be) and a 4-second position predictor (velocity vector -- where you'd be in 4 seconds from now if you changed nothing). All this was riding on the course ribbon (the highway). You "drove" along this highway, trying to stay "in the lane". It looked and felt like I was driving a race car on a race course in a video arcade game.

I flew 6 instrument approaches under simulated IFR (with the hood on). 3 from the right seat and 3 from the left seat. The conditions of the experiment were that I received NO training on the PFD and no training on the Aztec prior to the flight. They basically chunked me in the plane and made me fly the experiment cold. With no twin-engine time and obviously NO clue about the power settings and configuration changes for an Aztec, I was given 10 minutes flying time enroute from the takeoff field (KPHF) to the instrument approach airport to get familiar with flying by EFIS alone. (You were expected to use the MX20 and

## **FASCINATING WHAT YOU CAN FIND ON THE WEB!**

Here's one put up by a guy who claims to have been involved with John Denver's purchase of his Long EZ.

<http://www.ecobb.net/denver.htm>

CNX-80 too.) The NASA pilot in command did the takeoffs, missed approaches, and positioned the plane for the start of the each run. Oh, and by the way, the plane was broadcasting a differential GPS signal being tracked/recorded by a telemetry van in the airport's parking lot. The guys in the van knew where we were in space within a foot.

### **Well, how was it?**

Flying with the PFD was all TOO INTUITIVE. This particular GPS approach was configured as a "T", which means I had a 90-degree turn at the top of the "T" when going from the initial approach fix to the final approach fix. I knew the turn was coming fast because I could see the 90-degree turn coming up fast in the course ribbon on the PFD. It looked like a tight, 90-degree high-banked curve. The bank angle gives you some clue as to the bank angle you'll need to make the turn. Sort of replaces the turn coordinator. As I started the turn, there was no doubt I was going to screw it up because the flight director box went left and the velocity vector went right. I've never flown an Aztec before and I didn't anticipate enough to overcome its heavy controls. (I made sure THAT never happened again.) I intercepted the localizer and glide slope quickly by simply flying the plane back onto the road and putting/keeping the velocity vector back inside the box! As long as I kept the vector in the box, I was right on the localizer, right on the glide slope. The whole time I'm going down the pipe, I could "see" the runway off in the distance at the "end of the road". The symbology said I was headed for AKQ RWY 20. Now how cool is that?

I flew two more GPS approaches with the PFD, this time more prepared to anticipate and keep up in the turns. And I did.

So we landed so I could swap to the left seat and fly the same approach three times using the traditional instruments. Wow, did everything seem foreign. Whadya mean I have to watch 7 instruments? I felt behind the airplane and I felt behind the navigation. Now I don't fly a lot these days since I tend to use my money and time building my Cozy, so I wasn't especially sharp. But I had completed an IFR competency check not more than 4 weeks ago. And I still feel competent/safe. Well after using the PDF, I didn't feel so accurate on the gages anymore. I already knew what the

results using the PFD would be.

There were times on the traditional instruments when I wandered off course by as much as 0.3 miles and wandered off glide slope by as much as 50 feet. With the PFD, my largest errors were 50 meters laterally and SIX FEET in altitude.

So far, for all pilots, the PFD experiment is showing a 5:1 improvement in approach accuracy!!! The theory is that pilots are REACTIVE to traditional needles, meaning you have to observe the needles moving first to know something needs to be corrected. By the time the needles move you're already behind the navigation. You end up "chasing the needles." But the PDF software is PREDICTIVE. When the predicts start to move, you have enough time to alter course to stay AHEAD of the navigation.

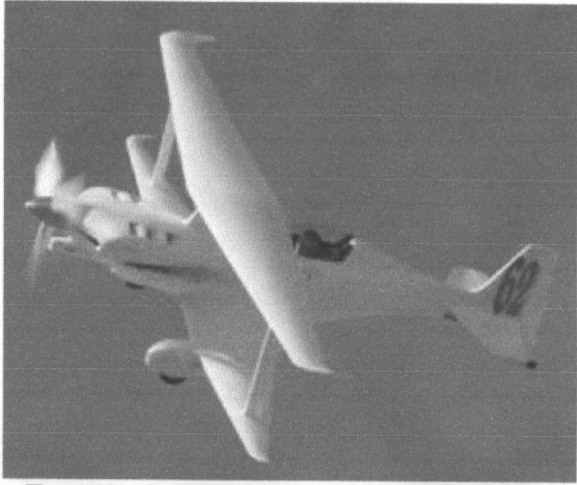
The control group is flying this same experiment and the same PFD in the fixed-base Malibu simulator. Funny thing is, pilots tend to fixate on the PFD, especially on seeing the little picture of the runway. A few of them flew through decision height and right into the runway! So there's still some tweaking left to be done with the final product.

L. Wayne Hicks  
Senior Engineer  
Zel Technologies, LLC

### **LIPP'S PROP LICKS COMPETITION BIPLANES TOM ABERLE'S UNUSUALLY FAST BIPLANE AT RENO**

From the Ch 170 N/L

Biplanes are historically the slowest class at Reno, but that changed this year, as Tom Aberle, who didn't race his Phantom last year after qualifying fastest (due to a propeller problem), again qualified fastest in 2004, running over 241 mph. Noting that the fastest T-6 (Alfred Goss in Warlock) went just over 238, Aberle, a former biplane champ, said, "Well, now the T-6s are the slowest class at Reno. We're even faster than all but four of the Formula Ones. We're 20 mph faster than last year."



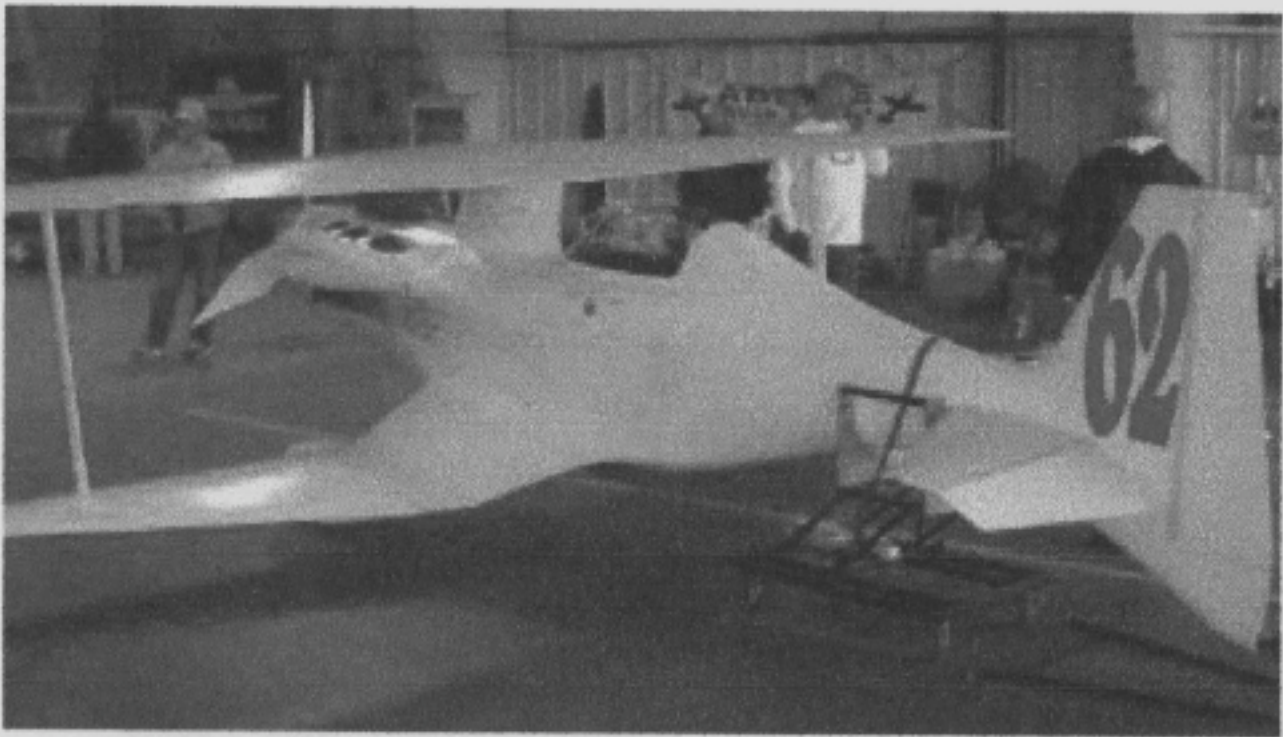
**Tom Aberle's Unusually Fast Biplane at Reno**

Tom attributes that speed increase to two main changes: he sawed off the exhaust pipes ("We had ten inch stacks last year. They weren't tuned any-

way, so why have them out in the air?"), and he has a new, three blade prop. "Paul Lipps offered me two props to try, provided we'd give back good performance parameters. Then he'd build one, optimized for the machine. I fed him the data, and in a week and a half, he had a design."

Paul, who cruises over 200 mph in his stock-engine Lancair 235, has some unusual prop design ideas, but they seem to work for him, and for Aberle. "Last year," Tom said, "we were turning 3550 rpm, and went twenty mph slower. Now, we're turning just 3300. Once the wheels are off the ground, it's like a slingshot."

Lining up for Saturday's race, David Rose (Rose won last year, and was second-fastest qualifier this year) commented on the cold temps and high



**Paul's Prop on Race 62**

winds. "It's a bit chilly." A fan nearby said, "That should be good for four more horsepower." Rose, heading for his airplane, responded, "I'll need a lot more than that." In the Gold, Aberle just smoked the field, finishing about 24 seconds ahead of David Rose, with Norm Way another 21 seconds

back. Speed difference was huge: 238, 219, and 206 (rounded), respectively. Aberle showed up at the awards banquet in a white coat and patent leather shoes. The former Formula One champ was ready for this.