



## EAA Chapter 17-- Knoxville, TN

### President's Comments

*From Don Miller, President, EAA Chapter 17*

### Chapter Leadership:

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???

This could be you!

### Tennessee School for the Deaf - Kids Fly Free

Our Chapter 17 members, the East Tennessee General Aviation Association, Aircraft Radio Control Club of Knoxville (KCRC), and Knox Air will join forces to present an afternoon of aviation experience for our neighbors, the Tennessee School for the Deaf. The program will begin at 3:00 P.M. at the Knox Air terminal hanger. This unique program is scheduled for a weekday due to the fact that the TSD students go home on weekends. We encourage all pilots to help spread the word to residents of Island Home community and others who may have an interest. We are not accepting the general public for flights, but encourage them to drop by to see the youth rides.

### Trip Report – Sun 'n Fun 2004

Several local pilots flew or drove to Lake City, Florida to participate in the annual fly-in. My group included Jean Francois Reat, Thad Phillips and myself. After several years of hearing tall tails from former participants I decided it was time to see for myself! The Fat Boyz newsletter listed Buz Witherington as the coordinator contact and that connection linked Dr. Reat with me to go. Jean has finished his instrument rating recently but is currently using club airplanes to fly. Sun 'n Fun is a major regional event drawing 150 to 200 thousand visitors and exhibitors. All three of us were first time Sun 'n Fun visitors and we were filled with anticipation about the flight to come and the program. The outlook was for fair skies throughout the Friday, Saturday and Sunday period which we had planned our travel. AirNav.com listed fuel prices at the mid-point ranging from \$1.99 to \$2.69. Unfortunately the highest prices were at the location with the best IFR approach facilities. After quite a bit of discussion we opted to file IFR with the idea that favorable weather would find us canceling in route and diverting to the cheap fuel. As it turned out we choose to divert both ways and paid \$2.05 on the outbound trip and \$1.99 on the return. Future travelers should be aware that the ATC system becomes saturated with Sun 'n Fun traffic and VFR flight following is usually declined by them for lack of available transponder codes. We all had a blast and would highly recommend the trip to anyone. To see a video and still photos of the trip come to the next EAA meeting on May 5, 2004, at 6:00 p.m. in the Knox Air classroom at DKX.

### Fly the Fortress!

Chapter 17 is off to a strong start this year. Several programs are planned and more are in the works. Our B-17 chairman, Ralph Wallin, and his able partner in crime, Bill Lofgren, have set in motion a good plan for the September 7 & 8 visit of the "Fortress" to GKT. EAA is offering historic flight experiences in its beautifully restored B-17G Flying Fortress "Aluminum Overcast." This aircraft is an example of the American

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heavy bomber that helped turn the tide of battle in World War II. Fly a mission back in time and feel the might of this magnificent aircraft, just as those brave young men did more than 50 years ago. The Boeing B-17 "Flying Fortress" is a World War II bomber used primarily in Europe. B-17s from the Eighth Air Force participated in countless missions from bases in England. These missions often lasted for more than eight hours and struck at targets deep within enemy territory. Because of their long-range capability, formations of B-17s often flew into battle with no fighter escort, relying on their own defensive capabilities to insure a successful mission.

During the war, B-17s were among the most modern aircraft in the U.S. inventory. However, the advent of the jet age and advances in technology made the Flying Fortress obsolete soon after the conclusion of the war. In the years following World War II, most B-17s were cut up for scrap, used in Air Force research or sold on the surplus market.

The B-17 received the name "Flying Fortress" from a Seattle reporter who commented on its defensive firepower. The B-17 underwent a number of improvements over its 10-year production span. Models ranged from the YB-17 to the B-17-G model. Throughout the War, the B-17 was refined and improved as battle experience showed the Boeing designers where improvements could be made. The final B-17 production model, the B-17G, was produced in larger quantities (8,680) than any previous model and is considered the definitive "Flying Fort." With its 13 .50-caliber machine guns -- chin, top, ball and tail turrets; waist and cheek guns -- the B-17G was indeed an airplane that earned the respect of its combatants. In addition, aircrews liked the B-17 for its ability to withstand heavy combat damage and still return its crew safely home.

Between 1935 and May of 1945, 12,732 B-17s were produced. Of these aircraft, 4,735 were lost during combat missions.

Today, fewer than 100 B-17 airframes exist and fewer still are in airworthy condition. At one time, more than 1,000 B-17s could be assembled for mass combat missions, less than 15 of Boeing's famous bombers can still take to the air. Ralph has a list of volunteers who have agreed to serve a shift at the ticket table or sell souvenirs, but more are welcome. Contact him at 865 609-2712 or [wallinjr@esper.com](mailto:wallinjr@esper.com).

DRM

### Jim Bridges RV-9A project is June program.

Jim has been working for 2.5 years on this innovative design. What sets the RV-9A apart from other RV designs? The most obvious change is the new wing. It is longer and narrower than the wings of the RV-4/6/8 series, and uses a new Roncz airfoil. While the enlarged wing area at 124 square feet is only 12% greater, the span has been increased by 5 ft. The flaps are a long span, slotted, high lift design that allows the airplane to land slower than many primary trainers. To some, the RV-9/9A seems to be a "downward shift" from previous RVs. We don't see it that way. Van's has always striven for "Total Performance"; the ability to do as many things as possible well. But all airplanes are compromises, and no matter how versatile, each is biased toward a particular "mission." We have noticed that blazing speed and "wring-it-out" aerobatics are not primary interests for many pilots. Their day-to-day flying consists of local trips and short cross-countries, with only occasional long flights. The RV-9/9A was designed to do its best in this environment. The performance it provides is useable every day. It's so easy to fly that low-time pilots can make a quick and painless transition. Its short field performance permits it to easily use all the "fun" airports around. When it's time for that long cross-country, the RV-9A will get you there and back almost as quickly as many of the "go-fast" designs.

Jim has the wings and tail assembly completed and most of the fuselage completed. It was a standard kit, not a quick built design. His house is off Old Niles Ferry Road in Maryville. Complete instructions will be published in the May newsletter.

## WEB SITE CORNER

This month, we have two featured websites. The first is the website for the new Steven Udvar-Hazy Center, the National Air & Space Museum annex located on the grounds of Dulles International Airport (IAD). It is a fantastic collection of aircraft and well worth a visit. Start here: <http://www.nasm.si.edu/museum/> for an overview of the entire NASM, Garber Facility, and the Steven Udvar-Hazy Center. Some of the things to note are the restoration photos of the Enola Gay, the Pitts Little Stinker biplane, and the proposed restoration of the Saturn V rocket at the Johnson Space Center in Houston, TX.

The second site is a derivative of the first, which has a rare collection of 3-D cockpit photos available on line from selected aircraft in the new Smithsonian Air & Space Museum. Prior to installing the aircraft in the new museum, the cockpits were photographed with panoramic cameras and put on this website: <http://www.nasm.si.edu/interact/qtvr/uhc/qtvr.htm> Check it out!



**An 18 minute video of the  
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in high quality DVD is now  
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anytime on weekends.**

## Newsletter Editor's Corner

*By Ed Dumas Jr, Treasurer/Newsletter Editor EAA Chapter 17*

The Article of the Month for April was contributed by Dick Merian. Dick sends an article from the Daedalus Flyer (a journal for military pilots) entitled "The Golden Road To Samarkand", which describes the exploits of a young British pilot flying in what is now modern-day Afghanistan in 1938. It is full of stories of great flying in open-cockpit biplanes and tells tales of adventurous flying to deliver mail and supplies to remote regions of the British Empire. Unfortunately due to its size, the article cannot be reprinted here. I will, however, post it to the EAA Chapter 17 web site and send e-mail when it is available. If you want to read a copy before it gets posted to the web site, send me e-mail and I will forward the article to you.

As always, if you want to pay dues, please send them to me at the address below, checks please (\$20, payable to EAA Chapter 17).

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## Chapter 17 Classified Ads:

EAA Chapter 1016 will hold a fly-in June 12th BY INVITATION ONLY to EAA Chapters within an approximate 225 NM radius of Asheville. Airports included in the air tour will be Asheville, Hendersonville, and Transylvania County. For details please go to: <http://www.eaa1016.org/airtourposter.html>

Two Champs: Dave Swindler, President of EAA Chapter 419 (Nashville) is handling the sale of two Champs for the estate of a member. Call Dave Swindler - 615-890-2439.

C-172M: IFR, excellent condition. Go to: [http://www.geocities.com/n73440/c\\_172/](http://www.geocities.com/n73440/c_172/) (DKX) Todd Jeffers - 865-573-9285.

Instruments needed for an IFR C-172, new or used, good-looking, legal. Call Gordon Webster - 865-717-0917.

Six 2004 EAA Calendars are still available! Call Ed - 865-670-8473.

## A Visit to Baylor University's Institute for Air Science

by Ed Dumas, Jr

I visited Waco, Texas and Baylor University last month to meet with Dr. Max Shauck and his wife Grazia Zanin. Max is a professor of Aviation Science at Baylor University and Grazia is director of the Baylor Institute for Air Science (BIAS).

The focus of the BIAS program is twofold: First, they are actively researching the use of ethanol fuels for general aviation aircraft, and second they are using the ethanol-powered aircraft to perform air quality and atmospheric research.

The purpose of my visit was to evaluate their Velocity as a potential aircraft to receive instruments developed by NOAA's Air Resources Laboratory (NOAA/ARL) for atmospheric research and to help explore ways that NOAA/ARL and BIAS can do cooperative atmospheric research.

BIAS has many aircraft that are used for their fuel and atmospheric testing programs. They include a Velocity, a Piper Pawnee, two Piper Aztecs, a Cessna 152 and 172, a Beechcraft King Air (yes, ethanol does run turbines, also!), and a Pitts S2-B. Max flew the Pitts in airshow demonstrations for more than 10 years demonstrating the power and efficiency of ethanol fuel, including the Paris Airshow, Oshkosh, and lots of other airshows across the country.

First, I'll give a bit of background on the ethanol fuel research. Max and BIAS began research into using ethanol fuel to power piston and turbine aircraft in the 1980's. To prove the practicality of flying ethanol powered aircraft, he and Grazia bought the prototype Velocity and made a transatlantic flight in 1989. The flight was made entirely using ethanol fuel and culminated with the display of the aircraft at the 1989 Paris Airshow. They added an extra 160-gallon fuel tank in place of the back seat to make the long non-stop flight legs possible.

Max and Grazia joined an elite group of aviators when they made their transatlantic flight. They won the Harmon trophy for the transatlantic ethanol flight and joined the ranks of aviators such as Charles Lindberg, Howard Hughes, Chuck Yeager, and Scott Crossfield.

One key reason to use fuel from renewable resources is to help the environment. To illustrate the

point, consider CO<sub>2</sub>, the greenhouse gas that is largely responsible for global warming. Consider that the carbon contained in the oil that is refined to produce 100LL (and automobile gas, for that matter) has been stored in the ground for millions of years. When oil is refined and the resulting fuel burned in the atmosphere, the carbon that had been stored in the ground is now released into the atmosphere. This results in a net increase of the overall atmospheric CO<sub>2</sub> budget.

Renewable fuels such as ethanol are made from starches, sugars, and cellulose. The most common ingredient in ethanol fuel is corn. In order for corn to grow, it extracts carbon *from the atmosphere*. After the corn is refined into ethanol and burned in the atmosphere, the CO<sub>2</sub> that results from the combustion process does not add to the overall CO<sub>2</sub> budget of the atmosphere. The result is a step toward stabilizing the total amount of atmospheric CO<sub>2</sub>, not elevating it, as is the case with burning fossil fuels.

As you might expect, there are some differences between 100LL and ethanol. The total amount of energy in a gallon of ethanol is about 60% that of the same gallon of 100LL (75,000 BTU for ethanol versus 125,000 BTU for 100LL). However, the amount of extra ethanol you have to carry to go the equivalent distance as you would on 100LL is not as great as those numbers suggest.

Quoting from *The Case For Ethanol*, a report available on the BIAS web site listed below:

"With simple modifications to the fuel system to allow more fuel flow, ethanol burns cooler and cleaner, it resists detonation and it produces higher thermal efficiency and power than combustion of gasoline in a conventional engine. The only drawback associated with ethanol is a slight reduction in range (20 to 10 percent depending on engine compression ratio) due to its lower caloric content. Because of its chemical simplicity, ethanol characteristics as a fuel are far more consistent and predictable than 100LL."

Currently, ethanol is available for about \$1.20 to \$1.30 per gallon, and with new production technologies (made from recycled garbage, of all things), ethanol could be produced for \$0.67 to \$0.80 per gallon.

As a nice treat, Max brought out the Pitts S2-B and took us each for a 15-minute aerobatic ride! That was icing on the cake to convince me that ethanol fuel is indeed an extremely viable alternative to 100LL. Plus it smells good, too!

We did all sorts of rolls (barrel, aileron, slow, 4-point), inverted flight, a ½ Cuban eight, and some wingovers. I even got to try my hand at a couple of aileron rolls (very easy, actually).



**Figure 1. Dr. Max Shauck and his ethanol powered Pitts S2-B.**

But, the real reason I was there was to look at the Velocity and help evaluate the feasibility of adding a turbulence probe and data acquisition system that NOAA has developed and prototyped on its Long-

For more information, please visit the following web sites:

Baylor Institute for Air Science:	<a href="http://www.baylor.edu/bias/">http://www.baylor.edu/bias/</a>
BIAS alternative fuel research:	<a href="http://www.baylor.edu/bias/index.php?id=111">http://www.baylor.edu/bias/index.php?id=111</a>
BIAS atmospheric science program:	<a href="http://www.baylor.edu/bias/index.php?id=4843">http://www.baylor.edu/bias/index.php?id=4843</a>
The Case For Ethanol Fuel:	<a href="http://www.baylor.edu/bias/index.php?id=4556">http://www.baylor.edu/bias/index.php?id=4556</a>
NOAA/ARL atmospheric research:	<a href="http://www.atdd.noaa.gov/">http://www.atdd.noaa.gov/</a>
The Harmon Trophy:	<a href="http://www.nasm.si.edu/research/aero/trophy/harmon.htm">http://www.nasm.si.edu/research/aero/trophy/harmon.htm</a>

EZ research aircraft. Since the other component of the BIAS research involves air pollution monitoring, they spend a fair bit of time flying around cities such as Dallas/Ft. Worth, Austin, and Houston.

Houston turns out to have some of the most consistently bad air quality in the U.S., partly due to the high ozone concentration levels that result from industrial pollution. Unfortunately, the trait is also shared with East Tennessee, which also has among the most consistently bad air quality in the U.S., as well.

To help better understand the air pollution problems, most of the BIAS aircraft are loaded to the hilt with chemical instruments that sample air and measure the O<sub>3</sub>, NO, NO<sub>x</sub>, and NO<sub>y</sub> concentrations. These are flown typically for monitoring programs sponsored by the Texas Air Quality Board, EPA, DOE, and other funding agencies. The BIAS folks stay busy with their air quality measurements, flying several hundred hours each year.



**Figure 2. Air inlets on Baylor University's Piper Aztec atmospheric research aircraft.**

Anybody know of a good Pitts for sale, cheap?

**Could this have been you? Think before you fly!****NTSB Reporter - February 2004**

MAKE/MODEL - PIPER PA-28RT-201

ENGINE MAKE/MODEL - Lycoming IO-360

AIRCRAFT DAMAGE - Destroyed

NUMBER OF ENGINES - 1

TYPE OF OPERATION - Instructional

FATAL Crew – 2, PASS – Minor injury 1

LAST Departure Point - Lebanon, Tennessee

DESTINATION - Nashville, Tennessee

AIRPORT PROXIMITY - Off airport

CONDITION OF LIGHT – day, LOWEST CEILING – none, BASIC WEATHER - Visual meteorological conditions (VMC), VISIBILITY - 10.0 statute miles, WIND DIR/SPEED – calm.

PILOT IN COMMAND - commercial single-engine land, multi-engine land, instrument airplane, flight instructor FLIGHT TIME (hours) TOTAL ALL AIRCRAFT - 1,675.

Occurrence - LOSS OF ENGINE POWER, Phase of Operation - DEPARTURE CLIMB. HISTORY OF THE FLIGHT: On July 2, 2002, at 1500 central daylight time, a Piper PA-28RT-201 operated by a flight school, collided with the ground during initial climb after takeoff from Lebanon Municipal Airport, Lebanon, Tennessee. The instructional flight was operated under the provisions of Part 91 and visual flight rules. Visual meteorological conditions prevailed at the time of the accident. The airplane sustained substantial damage, the certificated flight instructor and the private pilot sustained fatal injuries, and the commercial-rated passenger received minor injuries. During the engine run-up, the rear seat passenger, a commercial rated pilot, noticed that the checklist was not used; however, the magnetos were checked. The left magneto operated normally, but when the right magneto was selected, the engine lost power. A short discussion between the pilot and the CFI ensued, and a decision was made to continue the flight on one magneto since it had been done successfully in the same plane the previous week. The private pilot was cleared for takeoff from runway 19. When the airplane was a couple hundred feet above the trees, the passenger heard the CFI tell the private pilot to "Watch the airspeed, and keep it straight." The passenger looked out of the window and noticed the airplane was slightly nose-up, and felt the "airplane sinking." The CFI took over the flight controls and banked the airplane to the right.

**PROBABLE CAUSE: CFI attempting flight with known deficiencies in equipment and subsequent loss of engine power.**

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Please Deliver To:

**EAA Chapter 17**  
**Regular Meeting**

Wednesday, May 5  
6:00 p.m. at DKX.

