



Hangar Talk

Northern Palm Beach County Experimental Aircraft Association
Chapter 203, Inc., March 2010

THE NEXT EAA CHAPTER 203 MEETING will be held at North County Airport in Jim Cook's Palm Beach Avionics hangar at 7:30 PM on Thursday, March 11th, 2009. From the junction of the Beeline Highway (SR710) and PGA Blvd (SR786) go 2.6 miles NW; turn left at the airport sign, cross the train tracks. Follow the road to Jim's hangar, which is on the left-hand side before you get to the FBO terminal.

Happenings

By Joe Scaglione

February Member Meeting

The February 11th meeting was held at the **Palm Beach Avionics** hangar and attended by twenty-four people, including **Dave Walsh** of **Sikorsky**, our main speaker, and **Rick Golightly's** guest, **Pete Lummis**.

The business conducted that evening was as follows. **Scott Curry** presented the financial report. The balance in the bank as of that day was \$12,197. Scott counts just twenty-nine paid members so far this year, and asks that if you haven't paid yet, please do so soon. In other financial business, Scott has forms for the **IRS** if you or someone else has made a donation to the chapter.

President Bill Perry and distinguished member **Jim Cook**, to whom we owe thanks for the spacious meeting area, made some information available about the **Venture Fly-In**, which we sponsored on February 26, 27 and 28. Jim invited any **EAA** members or people who planned to help those days to feel free to sit in on any of the many forums that he has planned.

Once again, President Perry has stated that we should take time to look over the new **Airport Compliance Manual**. It's only slightly over 600 pages and supersedes regulations of just a fraction of that. It's eye-opening. If you think you understand what your government is doing to protect you, read some of this and you will come away knowing that they are only protecting the jobs of the people that print for the government.

If you recall, some question arose around the "through the fence" operations at some airports where communities allowed planes to taxi

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short distances from a hangar or private home on the boundaries of the airport. The Homeland Security/FAA legal brains just realized that they changed the rules without input from the public, and will call a do-over. There will now be a comment period allowed before they decide to change. You can access this document at http://www.faa.gov/airports/resources/publications/orders/compliance_5190_6/.

A 50/50 drawing was conducted. **Dr. Arnold Green** won, and there was also a consolation prize drawn, a tee shirt donated by **Rick Golightly**.

Ken Tower brought his **Mosquito helicopter** on a trailer as a static display. Most of the time before the meeting was spent around it. **Ken** did very well showing and explaining it although it was not the main program. After the main program, even more time was devoted to the **Mosquito**; everyone seemed to enjoy it.

Going from a basic small bird to the incredibly fast and complicated **Sikorsky X-2** is some leap. Let me say this first: **Dave Walsh** gave a very good talk. He brought a lot of it down to a level that some of us fixed-wing-seat-of-the-pants guys even understood. But some of the guys who got much more out of this would happen to be, **Steve Sinclair**, **Fred Gramling**, **Bill Perry**, **Rick Golightly**, and of

course **Ken Tower**. But for the rest of us, I'll try to give you some of what we garnered. Dave is the Chief of Testing for the **X-2**. Mostly, he gathered all the test data and put it in some sort of order after analysis. The first flight was in August 2008.

He gave a little background on the history of fast flight 'copters. The **Blackhawk**, which is no slowpoke at 150 kts, has blades that move at nearly supersonic speed. The advancing blade gives the lift and the retreating blade can actually stall on the inside at high speeds.

In the 1960s there was a prototype of a ship that could theoretically move 240kts. With 3 engines, it was heavy. It vibrated violently and was not stable. On top of all that it, used too much fuel to be taken seriously by anyone. So they ripped those plans up.

But now with the development of smarter computers and even smarter engineers, and just to mention the inspiration of the home-built community, a lot of the problems are getting solved. That is why Dave refers to the **X-2** as a home-built.

They borrowed many parts and systems from other projects to come up with this. They are using a Comanche stealth helicopter engine

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with two counter-rotating blades, and FADEC (Full Authority Digital Electronic Control) with three computers that can operate any or all of the systems in unison or independently. There are still more test flights, but soon the X-2 is expected to fly at 270 kts, maybe, could be, possibly a few knots faster.

We'll have a report on the Venture Fly-In (February 26, 27, and 28) in the next issue.



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Mosquito: A flyweight helicopter



EAA 203 chapter member Ken Tower points out details of his Mosquito single-place, lightweight helicopter. Ken built the rotorcraft from a kit from Mosquito Aviation and has made some short hover flights. He hopes to have his certificate of airworthiness within a month or so. Ken will have more to say about the Mosquito at the March chapter meeting, when he will be the featured speaker. Pictures of Ken's build can be seen at: <http://tinyurl.com/ygxdckn> Photo and article by Mike Kaiser

FAAST Blast — February 18, 2010

Biweekly FAA Aviation News update

Coming Soon: March 31 Deadline for Replacing Paper Pilot Certificates

Pilots who have not yet traded in their paper pilot certificates have until March 31, 2010, when the paper certificates are set to expire. If you're still using paper, don't delay. Pilots can no longer exercise the privileges of their paper pilot certificates after the March 31 deadline. Student certificates are not affected and certain non-pilot certificates, such as those issued to AMTs, are still valid for three more years before they need to be replaced.

Renewing a certificate can be done online or through the mail, and instruction can be found at: http://www.faa.gov/licenses_certificates/airmen_certification/certificate_replacement/. Requesting a replacement certificate online requires creating an account with Airman Certification Online Services, which only takes a few minutes. Being registered can help you in the future with quicker processing of an address change or a replacement certificate request.

To process a request by mail, fill out and send in Form 8060-56 (10/09)—see above link—along with a \$2 replacement fee. Make your check payable to FAA. New certificates will take four to six weeks to arrive with mail processing and seven to ten days for online processing.

[This refers to the old paper certificates; the new certificates are laminated plastic.—ed.]

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Sign Up Now to Receive Electronic Notification of Airworthiness Directives

Starting March 1, 2010, FAA will no longer mail paper copies of Airworthiness Directives to aircraft owners and operators. You can sign up to receive this information electronically. If you have not already done so, go to <http://rgl.faa.gov> and sign up to receive electronic copies of Airworthiness Directives (AD) and Special Airworthiness Information Bulletins (SAIB). You can sign up by aircraft type as well as engine and propeller type. "This is an efficient and much faster way for you to receive important safety information," explains Jennifer Fleming, FAA Information Program Manager.

Everything You Ever Wanted to Know About Aircraft Ergonomics

Ergonomics, or human factors engineering, made its industrial debut during World War II out of the need to design more efficient and pilot-friendly aircraft. Cockpit design and comfort are even more important today and can make a crucial difference in safety. Read about the importance of integrating man and machine in "Aircraft Ergonomics 101" in the January/February 2010 issue of [FAA Aviation News](#). Other articles in this issue address fatigue, decision making, aircraft design and technology.

Produced by the editors, *FAA Aviation News*, http://www.faa.gov/news/aviation_news/

Address questions or comments to: AviationNews@faa.gov



Sikorsky X2 combines hover, high speed

By **MICHAEL KAISER**
skoop113@yahoo.com

A helicopter concept that germinated in the 1960s is maturing in the skies over the eastern shore of Lake Okeechobee.

Dave Walsh, chief of testing on the Sikorsky X2 experimental high-speed helicopter, appeared at the February meeting of Experimental Aviation Association Chapter 203 at North County General Aviation Airport to explain the project to members.

Although a helicopter's ability to hover is useful in many situations, designers have always had to sacrifice speed to exploit that utility because of the aerodynamic peculiarities of the spinning main rotor blades, Walsh said.

In hover, the tips of the rotor blades move through the air at about 500 mph. When flying forward, the blade that is moving in the direction of travel, or the advancing blade, experiences an increase in airspeed as the slipstream increases the amount of air flowing over it. The faster the helicopter travels, the closer the advancing blade tip comes to breaking the sound barrier, which dramatically decreases efficiency.

At the same time, the blade moving against the direction of travel, or retreating blade, experiences a loss of airspeed as it travels with the slipstream. That results in a loss of lift from that blade.

"The aircraft wants to roll over on the side of the retreating blade," Walsh said.

The X2's solution to the problem is a pair of coaxial rotor blades that spin in opposite directions. That way you always have one advancing blade on each side of the aircraft, balancing lift, he said.

The tail rotor of conventional helicopters is replaced on the X2 with a pusher propeller that adds forward thrust to push the aircraft to high speeds. Designers project that the X2 will eventually be able to travel at 250 knots, or 288 mph, although it has not yet approached that speed in testing.

The current helicopter speed record is 249 mph set by a British Lynx. But the flight was a one-time record attempt, and the aircraft never flew again because the airframe was overstressed, Walsh said.

Sikorsky first addressed the retreating-blade stall problem with the Advancing Blade Concept program beginning in the 1960s. The first aircraft to put the technology to use was the S-69, which first flew in 1973.

That aircraft used three engines: a Pratt-Whitney PT6T-3 turboshaft to drive the rotors and a pair of J60 turbojets to provide forward thrust. It reached 240 knots, or 276 mph, in level flight, Walsh said.

The aircraft's potential was limited by three trouble areas:

- The three engines were thirsty and limited endurance to about 30 minutes, Walsh said.
- The complicated controls created a high workload

for the two crew members.

"It had two pilots and you needed them both," Walsh said. "There was a lot to do in that aircraft."

- The coaxial rotors created excessive vibration.

The X2 improves fuel efficiency by replacing the three engines with a single 1,650 HP turboshaft engine borrowed from the canceled Comanche stealth helicopter program.

A gearbox splits the power output between the rotors and the pusher prop. The pilot can control how much of the power goes to which system depending on flight mode: During high speed forward flight, about 1,200 HP will be



directed to the pusher prop, Walsh said.

Pilot workload is reduced by a fly-by-wire system incorporating triple-redundant computers. The X2 is a single-pilot ship.

Vibration is addressed by an Active Vibration Control system that uses spinning masses controlled by a computer to generate vibrations exactly 180-degrees out of phase with aircraft vibrations, canceling each other out, Walsh said.

The X2 has been granted an experimental airworthiness certificate and had its first flight in August 2008. After initial testing at the Schweizer plant in Elmira, NY it was trucked to Palm Beach County for high-speed testing. The company has a testing area over part of western Palm Beach County and does most of its testing over the eastern shoreline of Lake Okeechobee, Walsh said. The X2 is always accompanied by an observer aircraft for safety.

The X2 technology will likely find its first production role in a new Light Tactical Helicopter for the U.S. Army, Walsh said.

The company in May unveiled a mockup of such an aircraft at the Army Aviation Association of America annual convention in Nashville, Tenn.

"These technologies can potentially bring new rotorcraft capabilities that, to date, have been unachievable by the industry," said Sikorsky President Jeffrey P. Pino. "In addition to doubling the speed of helicopters, this technology can improve hot/high performance, maneuverability and low acoustic signature."



Sport Pilot & Private Pilot Ground School

1. How can you determine if another aircraft is on a collision course with your aircraft?

- A. The other aircraft will always appear to get larger and closer at a rapid rate.
 - B. The nose of each aircraft is pointed at the same point in space.
 - C. There will be no apparent relative motion between your aircraft and the other aircraft.
-

2. The most comprehensive information on a given airport is provided by

- A. the Airport/Facility Directory (A/FD).
 - B. Notices to Airmen (NOTAMS).
 - C. world aeronautical (WAC) charts.
-

3. In which situation is advection fog most likely to form?

- A. A warm, moist air mass on the windward side of mountains.
 - B. A light breeze blowing colder air out to sea.
 - C. An air mass moving inland from the coast in winter.
-

4. Which factor would tend to increase the density altitude at a given airport?

- A. A decrease in relative humidity.
- B. An increase in barometric pressure.
- C. An increase in ambient temperature.

(Answers are on pages eight and nine.)

Sport Pilot & Private Pilot Ground School

1. Answer C is correct.

The Aeronautical Information Manual, paragraph 8-1-8 states:

Collision Course Targets: Any aircraft that appears to have no relative motion and stays in one scan quadrant is likely to be on a collision course. Also, if a target shows no lateral or vertical motion, but increases in size, take evasive action.

Reference: Aeronautical Information Manual

2. Answer A is correct.

The Airport/Facility Directory provides the most comprehensive information on a given airport. It contains information on airports, heliports, and seaplane bases which are open to the public. The A/FD's are contained in seven books which are organized by regions. These A/FD's are revised every 8 weeks.

Reference: AC 61-23

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3. Answer C is correct.

AC 00-6A, Chapter 12 states:

Advection fog forms when moist air moves over colder ground or water. It is most common along coastal areas but often develops deep in continental areas. At sea it is called "sea fog." Advection fog deepens as wind speed increases up to about 15 knots. Wind much stronger than 15 knots lifts the fog into a layer of low stratus or stratocumulus.

Reference: AC 00-6A, Chapter 12

4. Answer C is correct.

AC 00-6 states:

Density altitude simply is the altitude in the standard atmosphere where air density is the same as where you are. Pressure, temperature, and humidity determine air density. On a hot day, the air becomes "thinner" or lighter, and its density where you are is equivalent to a higher altitude in the standard atmosphere - thus the term "high density altitude." On a cold day, the air becomes heavy; its density is the same as that at an altitude in the standard atmosphere lower than your altitude - "low density altitude."

Reference: AC 00-6A



EAA Chapter 203

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Vice President	Paul Hershorin
Secretary	Joe Scaglione
Treasurer	Scott Curry
Program Director	Scott Thatcher
Membership Chair	Steve Sinclair
Young Eagles	Rick Golightly
Librarian	Ana Scaglione
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Newsletter	Orville Alwin

TECH COUNSELORS

Composite and FWF	Bill Perry
All Except Composite	Craig Wilcox
All	Sherman Corning

MEETINGS

The Chapter normally meets monthly at 7:30 PM on the second Thursday of each month at the North County Airport spare conference room. Guests are welcome to attend two meetings, but are expected to join the Chapter at the third. Dues are \$30.00 per year.

NOTICE

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NEWSLETTER

Contributions need to be in the editor's hands by the last Thursday of the month, unless the moon is full, in which case the deadline is the Sunday preceding the third Thursday prior to the next scheduled meeting. Be an author! Send us something!

Other Stuff

Board of Directors Meeting

Please contact President Bill Perry for time and place of the March Board meeting.

Editor's Report

March 2010 Newsletter:
67 Email Notifications Transmitted

Membership

29 Current Paid Members
04 Honorary Members

Advertising

Two and one-half column-inches costs \$5.00 per month. A half-page ad is \$15.00 per issue. Digital artwork or photos are preferred. Contact the editor for further details.

Chapter 203 members with email addresses on file will receive email notification of the link to the on-line "Hangar Talk". Send your email address to the editor at sailair@alwin1.com, 561-427-4538 (cell phone), or 638 N US Hwy 1, #153, Tequesta, FL 33469.

Disclaimer

The content of this newsletter is provided for entertainment only. No claim is made, nor assurance given, for the accuracy of material presented, nor do we verify anything before we print it. Send rumors.

EAA CHAPTER 203
MEMBERSHIP FORM

Annual Dues \$30.00

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