The Bend High Desert Flyer of Chapter 1345

WEBSITE: http://1345.eaachapter.org/ ***KBDN AWOS 134.425*** **NOVEMBER 2012, VOL11, #11**

PREZ SEZ:

There has been a lot of Aviation news this past month. Felix Baumgartner became the first man to break the speed of sound while jumping from 128,000 feet! Rod Hightower almost broke the speed of sound as he "stepped down" as the President and CEO of our EAA. Rod brought in a lot of change and some old faces back at headquarters are now gone, because of it. There has also been a lot of talk about the lack of loyalty to EAA's "roots", homebuilt aircraft. This has happened before and change is always inevitable. Jack Pelton has been elected chairman of EAA's board.

The "Super Storm" that hit the East Coast has come and gone, leaving behind one of the worst natural disasters, this country has ever faced. All of my family lives back in Pa. and as of this writing, 5 days after the storm; some are just now getting power back on and my parents are still without power. I sometimes take for granted where we live, here in central Oregon. Great weather most of the time (OK South Sister, don't blow your top off now), no flooding (except the Greenwood underpass) and mild seasonal changes. That's why I live here.

The elections are still a week away (we will have a new president by the time you get this) and they will change our country, (for better or worse depending on your own political bent) for decades to come. I will be glad just to stop getting political phone calls all day long.

Henry has lined up Aeronautical Engineer Sonja Englert as our November guest speaker. She is also an engineering test pilot, author of several aircraft books for homebuilders, with projects that include Columbia 350 & 400, Adam A500 as well as gliders. Check out Sonja's company, "Caro Engineering" @ http://www.caroengineering.com . Sonja will be telling us about one of her current projects and you will be amazed to hear what she is doing now so you better show up to hear what this amazing woman has to say!

The next meeting is Wednesday, November 14th @ Pro-Air's conference room above their maintenance hangar. Doors open @ 6 with the meeting starting @ 6:30. Since it's been a little chilly at nights, I thought it would be a great night to make it a "chili night" instead of pizza. If you have a favorite recipe then by all means, bring it on down. I will be making enough for 10 so sides are also welcome. Wine and beer will be available as well as waters.

Spouses and friends are all welcome.

It is November so that means our chapter will be electing next year's officers. Don't be afraid to come to the meeting, as all the current officers are willing to maintain their positions (though a "Young Eagles Coordinator" would be nice). So come on out for a GREAT presentation, Great food and Great people!

See you then and bring a friend!

Thomas Phy, *President*

Treasurer's Report

Financial for period 1/1/12 through 10/31/12

Total Income:	$767.00
Total Expense:	$776.86
Net Income (Loss)	($ 8.86)
Cash Balance:	$2,073.69

Jack Watson, *Treasurer*

October Meeting Minutes

Minutes of a regular meeting of The Chapter, held on the second floor of the Pro Air maintenance facility at 63138 Powell Butte Hwy, October 10, 2012

ATTENDEES

In attendance were, Tom Phy, Jack Watson, Mike Bond, Henry Graham & Jim Stone,

CALL TO ORDER

President Thomas Phy called the meeting to order at 6:30 p.m.

MINUTES & TREASURER'S REPORT

As both the September minutes and Treasurer's report were reported in the September newsletter, without objection or correction they were accepted as published.

PROGRAM

Henry Graham presented his "project," an OCHOCO Autogyro which he began working on in 2004. Construction materials consist of a wooden lattice airframe overlaid with 2oz Dacron cloth utilizing semi-gloss house paint with a UV blocker. The group eagerly awaits the next installment on Henry's project.

The group then enjoyed Pizza and Coke & adult beverages while watching a forty-five minute EAA film titled "Flying for the sheer joy of it."

The meeting adjourned at 8:00 pm to reconvene, same time and place on November 14, 2012

Jack Watson, *Secretary/Treasurer*

Engineers Test Rotor Landing for Capsules

A team of researchers brought a pair of scale model space capsules to the Vehicle Assembly Building at NASA's Kennedy Space Center in Florida to try out a rotor system for use in place of parachutes on returning spacecraft.

The design should give a capsule the stability and control of a helicopter, but would not be powered. Instead, the wind passing over the rotors as the capsule descends would make the blades turn, as they do during helicopter auto-rotation descent. The blades would be hinged and balanced against airflow, so they would hold position, similar to bombs with fins that flick open safely at high speed.

The goal is for a controlled descent to the soft landing of a full-sized spacecraft whether on a runway or the top of a building. In effect, wherever a helicopter could land, a spacecraft could land, too.

The returning spacecraft could use a mechanism similar to the fins, except the capsule's blades would start spinning almost immediately after opening. Control fins would open on the side of the capsule, too, to keep it from revolving with the blades.

Testing may include hauling a roto-capsule for release from a high-altitude balloon and later trying them on a small capsule returning fragile science samples from the International Space Station. With the retirement of the space shuttle, the roto-capsule could find a successful niche pretty quickly, researchers said.

The rotor concept also fits nicely with spent rocket boosters. Instead of throwing away the stage and its valuable engines, rotors could be built into the booster frame and unfurled as the stage descends to Earth for a soft landing.

Arnold Ebneter's E-1

Arnold Ebneter, 84, of Woodinville, Washington, appears to have set another world aviation record for airplane fuel efficiency in his incredible E-1 airplane.

Ebneter, EAA 450548, unofficially set the record on October 5 during a nonstop flight from Harvey Field in Snohomish to Spokane; Pendleton, Oregon; and back to Snohomish, using 62 pounds of fuel achieving 55 mpg. That shattered the old mark of 67 pounds in the less than 1,100 pounds aircraft category.

The record will require verification by the Fédération Aéronautique Internationale (FAI) before becoming official. In July 2010, he flew his E-1 nonstop from Paine Field, Everett, Washington, to Fredericksburg, Virginia - an 18-hour, 27-minute flight covering 2,327 miles - to set a new world mark for the longest nonstop flight in an experimental aircraft weighing less than 1,100 pounds. He shattered that by 8 percent, well over the 1 percent required by FAI rules.

Ebneter's E-1, an all-metal stressed skin, tapered low-wing aircraft powered by a Jabiru 2200 engine, is the product of a 52-year design, build, and test phase that started in 1958 as the subject of his senior engineering thesis at Texas A&M University. It flew for the first time in July 2005. (Read more about Ebneter and his E-1 in the January 2011 edition of Sport Aviation.) It has a 74-gallon fuel capacity and a maximum speed of 175 mph.

He spent 22 years in the Air Force, 15 as a fighter pilot flying F-86 Sabres and F-100 Super Sabres, and retired as a lieutenant colonel after flying 325 missions. Ebneter also was an engineer with Boeing. After the military, Ebneter designed and tested balloons and once - as a test balloon pilot for General Mills - flew 325 miles overnight.

In honor of that flight, Arnold gave E-1 the same registration number as that balloon: N7927A.
He's also an FAA DPI at Harvey Field and is chief instructor for the helicopter flight-training program. All told he has logged more than 20,200 hours of flight time.

Fuel cells on Boeing 737

Japan's Ishikawajima-Harima Heavy Industries (IHI) has successfully operated a regenerative fuel cell system on a Boeing 737. In the trial, the fuel cell system generated electricity and was also 'recharged' by the aircraft engines. When surplus engine power is available, it can be used to drive electrolysis to split water into oxygen and hydrogen; the hydrogen is then used in the fuel cell, emitting only water vapor.

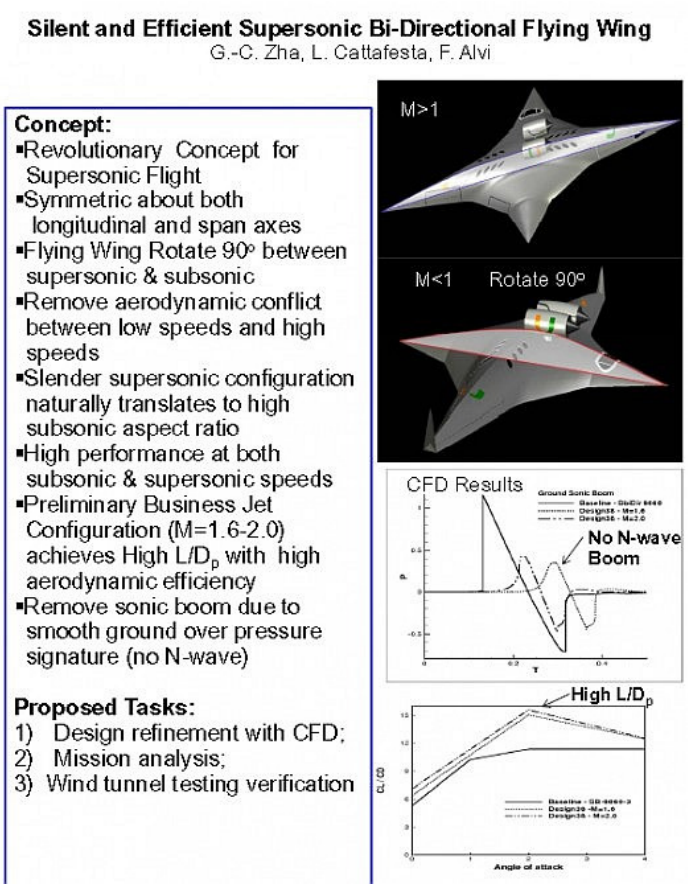
The fuel cell system is being developed as a possible auxiliary power unit (APU) for aircraft, in which it would power electronic systems. At the moment, electricity for these auxiliary systems is drawn from generators powered directly from the aircraft engines, but this is not an ideal solution and is subject to inefficiencies and power fluctuations. Fuel cell APU would be efficient, reliable and generate far fewer emissions.

IHI has been collaborating with Boeing since 2010 to develop the technology. The partners are working to improve the fuel cell system power output and reduce its footprint so that it can be installed in future aircraft.

American Airlines has loaned one of its brand-new 737-800 aircraft to Boeing for a three-month demonstration program to validate environmentally progressive technologies. This year's program includes:

- A regenerative hydrogen fuel cell
- Adaptive trailing wing edges
- A variable area fan nozzle
- Flight trajectory optimization
- Modular carpeting made from recyclable materials
- The use of biofuels for test flights

This trial will focus primarily on the coupling of the fuel cell to the aircraft power systems and the handling of hydrogen in the air. Next year's test plane will be a Boeing 787, a wider-bodied model, which will be fitted with ceramic matrix composite acoustic engine nozzles amongst other enhancements.



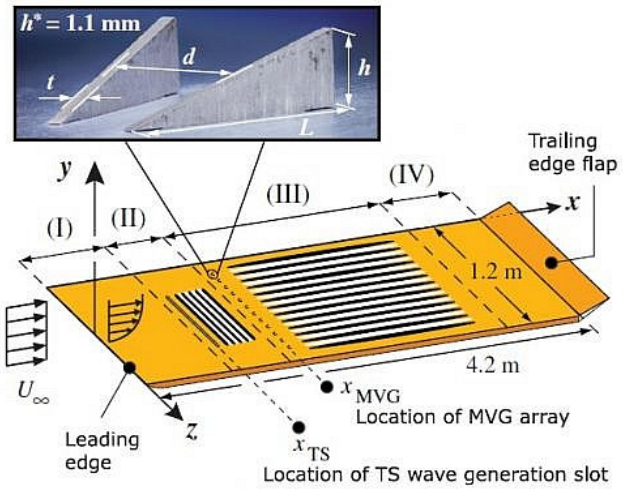
More on this bi-directional wing in next Newsletter

Scientists discover second purpose for vortex generators

Researchers from the Linné Flow Centre at KTH Mechanics in Stockholm, Sweden, and the University of Bologna, Italy, have demonstrated that simple vortex generators can minimize the boundary layer's drag by delaying its transition from a low-friction laminar flow to a high-friction turbulent flow. Their study is published in a recent issue of Physical Review Letters, of the American Physical Society.

An object's boundary layer starts out as laminar, or smooth and orderly. As the object continues to fly through the air, small disturbances create instabilities and, above a critical value, the laminar flow regime transitions to a turbulent one. The transition can easily result in an order of magnitude increase in skin-friction drag on an aircraft.

To demonstrate the effectiveness of using vortex generators to delay the transition to turbulence, the researchers attached miniature vortex generators (MVGs) to a flat plate and placed the plate in the wind tunnel at the Royal Institute of Technology (KTH) in Stockholm.



The researchers found that, under certain flow conditions, the MVGs can significantly delay the transition from laminar to turbulent flow. The disturbance energy inside a boundary layer can be reduced by three orders of magnitude by making use of appropriately designed MVGs.

However, if the conditions surpass a certain threshold, the boundary layer will actually transition to turbulence sooner than it would without the MVGs. To avoid this, the so-called "streak amplitude" must stay below a certain threshold. The streak amplitude is a measure of how much the flow is modulated in the span-wise direction, i.e., the direction perpendicular to the mean flow. The key is to design the MVG, especially its height, so the amplitude stays below 25% of the free stream velocity.

One advantage of using vortex generators to delay the transition to turbulence is that the mechanism is entirely passive, so it doesn't require the addition of extra energy into the system. Since the flow phenomena studied here exist in a variety of areas, such as lasers, plasma physics, and granular flow dynamics, the researchers hope vortex generators may be useful for a variety of applications that could benefit from turbulence delay.

Read more at:
http://phys.org/news/2012-09-scientists-purpose-vortex.html - jCp

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