EAA Mount Rainier Chapter 326 Newsletter

Thun Field – March 2010 135

Meeting Notice

Tuesday, March 9th, 7 PM
CAP Building, Thun Field

Program: Competition Aerobatics. John Coffey.

Refreshments: Paul Good

From the Secretary

February 9th, 2010 – EAA Chapter 326 Monthly Meeting

Kevin called the meeting to order offsite this month at Rainier Welding.

Treasurer Report: Paid Members, 75. Ending balance $5202.07

Tonight's meeting was a lesson in welding techniques and equipment with Lincoln Welding.

2010 Dues are due! If you haven't yet paid, drop it in the mail to Norm.

Arlington Airshow camp sites. There are some spots left with the group camp site for $95. Contact Kevin Behrent.

NW Aviation Conference was Feb 20th – 21st at the Puyallup fairgrounds. We had a good turn out of chapter members to greet the public and generate interest in experimental aviation. Thanks Lee for the BearHawk display, it really generated interest and discussion with visitors.

Andy Karmy, EAA Chapter 326 Secretary

Donated Sitka Spruce Finds a Good Home

You may remember a few weeks back John Sell donated a load of Sitka Spruce to the Chapter. Didn't seem like much…one 4 X 8 sheet of plywood and a lot of 1" thick boards, some as long as 10'. Didn't seem like much until you price that stuff in the Aircraft Spruce catalog… $8 to $9 per foot for the widths donated, yikes.

Anyway, Scott Cutler raised his hand for the lot and took possession at Bush Middle School just outside the perimeter fence of Olympia Airport. Scott is the seventh grade science teacher there and is building a Pietenpol Air Camper with a select group of 20, 7th & 8th graders.

Scott has broken the code on applying for grants… nothing big but he has received a number of grants totaling over $10,000 in the last two years and is expecting more. He has used the money to buy a wind tunnel, a hot wire foam cutter, airfoil simulation and aircraft design software, and Microsoft Flight Simulators. No district money is involved. Kids can design their own airfoil, cut it out in foam and then test it in the wind tunnel. "I have them calculate lift coefficients and plot drag polars. They can build models and calculate weight and balance. It all fits in to the physics part of the curriculum and they love it."

Here's how it all fits together:

"The Physics of Flight curriculum is for all 120 of my 7th graders. It teaches physics using the exciting topic of flight in an integrated approach that creates opportunities to tie the physics curriculum to other subjects such as Math and Social Studies. The lessons also use design challenges to expose students to a more realistic experience of how scientific knowledge is generated.

"Experiments using kites, hot air balloons, and parachutes are conducted to determine the forces an object experiences while moving through the atmosphere. The work with parachutes is the first experience the students will have using the design challenge process. The students are tasked with designing parachutes that fulfill different mission criteria. They are also introduced to the concepts of velocity and forces such as gravity and drag.

"Foam gliders are assembled by the students and used to reinforce their new knowledge. They also introduce students to the concepts of acceleration and lift and drag forces. Students continue their investigation of lift and drag forces and use the design process again as they use hot wire foam cutters to shape wings that are tested in our wind tunnel for lift/drag efficiency. After doing the necessary research on airfoils, the students are given the challenge to create an airfoil that is most efficient at one particular velocity.

"The students use software to design, build, and test fly their own balsa wood gliders. Moving from airfoils to an entire aircraft introduces the students to concepts of weight and balance. This requires them to acquire knowledge of balanced forces, levers, arms, and moments. The students are forced to negotiate with themselves and each other the meaning of these scientific concepts to create the best design. The concepts and facts are not seen by the students as useless since their understanding is needed to be successful in the challenge.

"The next challenge in the curriculum moves the students from simple gliders to evaluating methods of propulsion. The students create and test their own propeller designs that generate the maximum possible thrust using a small motor and other materials.

Next, students are asked to demonstrate how the movements of controllable surfaces on an aircraft create unbalanced forces that

allow aircraft to be controlled. Students use remote control (R/C) flight simulator software to practice their investigations in the controlled environment of the classroom before conducting a performance assessment with an actual R/C aircraft in the gym or outside.

Knowledge of how aircraft are controlled is reinforced as students are asked to construct a large model aircraft that allows a small occupant to control the aircraft using hydraulic power supplied by a garden hose. Our students will take the model to our three elementary schools and explain how aircraft are controlled as the elementary students ride in it.

"Students use their math skills in mapping and navigation exercises using aviation charts, plotters, and E6B computers. The students are totally engaged in their use to manipulate algebraic equations to determine distance, time, velocity, fuel flow, and wind correction. After planning a cross-country flight, the students are asked to conduct their flight on a flight simulator as their evaluation. The students get immediate feedback on the accuracy of their planning while flying the flight in the simulator. This knowledge is extended using NASA Smart Skies! The students take on the role of air traffic controller and use math to safely manage aircraft flying on conflicting routes.

"The final design challenge for the course is to design an actual aircraft using an actual aircraft design software program. Student teams are asked to design a actual aircraft that meets prescriptive physical and performance requirements set by the FAA. They will get a true experience of the challenges engineers face as they optimize the aircraft configuration.

"This culminating challenge requires the students to combine all of their gained knowledge of physics and aircraft design to create an aircraft that meets very specific criteria. Students will also be given the opportunity to build parts of an actual aircraft using various construction methods. Each method has its own advantages and disadvantages that the students will have to consider as they design their aircraft.

"Flight also opens up the world of future career opportunities. Students are more inclined to see the value of their education when they know it can lead to a successful career. The various design challenges expose the students to many careers in the aviation field.

"Throughout this challenge, just as throughout the curriculum, the class is focused on the scientific design process instead of lecture and confirmation lab work. Students are actively engaged in learning the physics of flight. Finally, the students get to experience the true nature of science instead of memorizing the "scientific method."

Wow… my undergraduate degree is in Aeronautical Engineering and I never got to do any of that stuff. Pencil, paper and slide rule only. jb

As for the Pietenpol, that will take a while. But Scott has the support of the school and "the kids would rather build than study physics."

Scott built an RV-6A for himself, an eleven year project. He's been flying it a couple years now. Here's a few pictures of Scott's classroom.

Scott and wind tunnel

Pietenpol fuselage frame

Got to start somewhere

Miracle at Cortez

Here is one incredibly amazing feat of airmanship. This is a story of dead sticking a U-2, at night, in the mountains, after a 200 mile engine out glide, into a mountain valley, onto a short runway in Cortez, Colorado.

Back in 1959, before Gary Powers was shot down, when few people knew of the U-2, six Chinese pilots (Nationalist Chinese from Taiwan, ROC) were sent to Laughlin AFB, Del Rio, Texas to check out in the U-2. They would return home to fly recon missions over mainland communist China (PRC).

There were no two-seat models of the U-2 at that time… single seat only. On August 3rd, Major Hsichun (Mike) Hua took off that evening to fly a round robin from Del Rio, north to Big Springs, Texas, northwest to Ogden, Utah, south to Delta, Utah and then back to Del Rio… sort of a narrow rectangular course. At 70,000 feet above an undercast cloud deck south of Salt Lake City, Major Hua flamed out. Pitch black, over the mountains, no autopilot, struggling with his fully inflated pressure suit, entering the clouds at 40,000 feet, unable to restart….

And try to imagine the look on the Airport Managers face when a Chinese guy in a space suit walks into his office in the middle of the night!

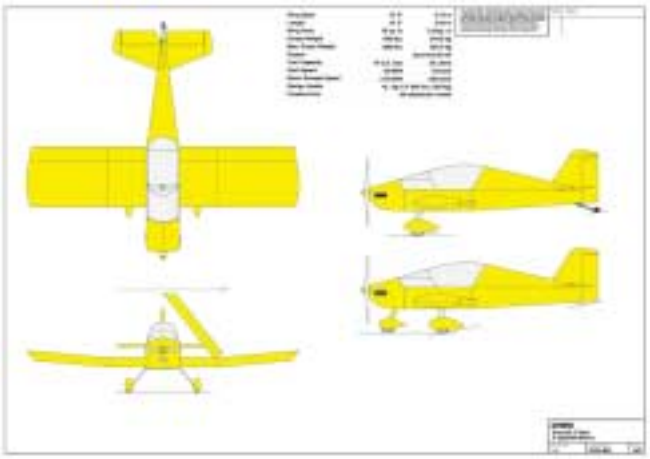
Here, listen to him tell it. What a story. Don't be put off by the introduction… it's worth the wait.
http://www.hmhfp.info/SG_09E.html

Major Hua returned to Taiwan and flew with the Black Cat Squadron… another piece of history to explore. Later he received a PhD in Aero Engineering from Perdue, rose to the rank of four-star General, and held leadership and management positions in Taiwan's aerospace industry.

Onex

You've heard of Sonex, right? Onex (pronounced "One-X") is a **single-seat** aircraft designed to offer an even-more economical way to build and fly your sport pilot aircraft! The **folding-wing design** can fit into a standard 7' garage door, and the wing panels can easily be removed for trailering at highway speeds. The Onex follows the Sonex Aircraft design and engineering tradition in offering a simple, robust, aerobatic aircraft capable of squeezing incredible performance out of lower powered engines.

Length: 16' 5"
Wing Span: 18' 9"
Wing Area: 78 sq ft
Empty Weight: 540 lbs
Max Gross Weight: 850 lbs
Cockpit width: 27"
Engine: AeroVee 80 hp
Fuel Capacity: 14 gal
Stall Speed: 45 mph
Never Exceed Speed: 216 mph
Design Limits: +6, -3 @ 850 lbs
Construction: All Aluminum Riveted



Will the Onex be available as a plans-built aircraft?

No. The Onex will be offered in sub-kits and as a complete kit. It will offer the best value per dollar of any single-place fully-aerobatic performance kit aircraft.

What's the Price going to be?

As low as possible. We would expect a completed Onex to run right around $20K including propeller, instruments, upholstery, engine, engine accessories and complete airframe kit.

Will Sport Pilots be able to fly the Onex?

Most definitely YES.

Will the Onex will be Aerobatic?

Yes. You will be able to do the same Aerobatic Maneuvers that Sonex, Waiex, and Xenos Pilots have become so famous for. Loops, rolls, spins...all kinds of fun stuff...so add Aerobatic flight training to your list of To-Do's and you'll be ready to go when your Onex is complete.

The Onex is not available yet… another reason to go to Oshkosh just to check. Or, keep checking their website.

http://www.sonexaircraft.com/research/onex.html

"Hell, there are no rules here, we're trying to accomplish something."
--Thomas Edison

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