



Next Meeting: Thursday September 16th, 2004
The meeting will start at 6:30 PM with a picnic, with Food supplied by Chapter 113. The regular meeting begins at 7:30 pm
Our guest speaker is Scott Casler from Hummel Aviation in Bryan Ohio; Scott will be bringing his Hummelbird powered by a 1/2 VW

EAA Chapter 113
Mark Freeland
38352 Churchill Lane
Farmington Hills, MI 48331

EAGLE'S September 2004

PROPWASH



CHAPTER 113

"The Backyard Eagles"

Mettetal Airport (1D2), Canton, Michigan



Our gracious host Dave McKenzie having way too much fun at his Flyin!
Photo Courtesy of Mark Freeland

Our Web Site: www.eaa113.org

Meetings: 7:30 p.m. the 3rd Thursday of each month at the
NEW EAA113 AVIATION EDUCATION CENTER!

EAA113@yahoogroups.com

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Mission

Statements

Chapter

“EAA Chapter 113’s major focus is on the relationships with people who have diverse aviation interests, centered around their love of flight, fellowship, learning and fun. Chapter members have a passion for flying and are willing to share it with others. Chapter 113 provides the opportunity for exchange of information as well as the interaction that leads to friendships that last a lifetime.”

Board

“The Board of Directors are to provide both advice and assistance to the chapter officers on an ongoing basis.

Calendar of Events

Saturday Morning Breakfast

Every Saturday 8:30am at the Coney Island on Lilley Rd. across the street from Mettetal airport.

Breakfast Fly-outs

Every Sunday from Mettetal airport. Arrive at destination by 9:30a.m.

The September (Picnic) Meeting

Please Note: The Sept 16th meeting will be starting at 6:30 PM with a picnic, followed by the regular meeting at 7:30. The Chapter will supply food. Please bring your appetite!



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President's Podium



Dave Buck (734) 453-5375
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Following is an article written in 1995 by Dave Buck. In light of the current sacrifices that the Men and Women of our Arm Forces are making, this article is in Honor of these fine Men and Women.

The invitation said, "You are invited to participate in USS ABRAHAM LINCOLN's "Operation Tiger 95". It promises to be a fantastic experience for everyone involved. We plan to show you just what the ABRAHAM LINCOLN can do. If you've ever wanted to get a real taste of Navy life, here's your chance. Come sail with us on the most powerful warship in the world. It will capture your heart and be a thrill of a lifetime."

"Operation Tiger" is the Navy's code name for a special guest cruise program. Ships returning from deployment are permitted to embark relatives and guests of crewmembers, known as "Tigers", to transit from Pearl Harbor to the West Coast. My son, Navy Lt. Gregory R. Buck, a Flight Officer on the nuclear-powered aircraft carrier USS Abraham Lincoln, was returning from a six-month deployment in the Persian Gulf. This was a chance to spend time with him, and for someone who loves aviation; a ride on an aircraft carrier was the opportunity of a lifetime.

I arrived in Hawaii in the afternoon on October 2 and took the shuttle bus to Pearl Harbor. Arriving at the dock I was greeted by Greg, and the awesome sight of the carrier. The Lincoln is almost 1100 ft long and

towers some twenty stories above the waterline. Talk about impressive!! WOW!!

We boarded the "boat" and went to Greg's quarters. He shares a room with five other pilots and flight officers, plus three fathers for a week. Including her air wing the Lincoln carries a crew of almost 6000 people, and this week there were an additional 1100 "Tigers" on board.

We had the run of the boat. (I still can't figure out why they call something this big a boat and not a ship). The only areas that were restricted were the nuclear reactors and engine room. Guided tours were conducted every morning and afternoon, and by the end of the week we had been shown through the entire ship.

Just getting around the ship takes some getting used to. All the interior passageways look the same and it is easy to get lost. When walking down passageways you are constantly going through bulkheads, stepping over "knee knockers", and dodging "head knockers". Going to different decks means climbing up and down ladders, not stairs. The flight deck is slippery to walk on and has winds of up to 50 knots at times.

The Lincoln is a small city. It has its own post office and zip code, TV and radio stations, a daily newspaper, a fire department, a library, a hospital, a general store, and two barbershops. The ship generates enough electrical power to supply a city of 100,000, and has the capability of distilling over 400,000 gallons of freshwater from seawater each day. The Lincoln is also a floating airport, capable of launching as many as four planes a minute. The boat carries nine different types of aircraft with a total compliment of 85 planes.

During flight operations, the 4.5-acre flight deck is a scene of intense activity. Four aircraft elevators, each the size of two city lots, bring aircraft up to the flight deck from the hanger deck. Small tractors spot the planes on the flight deck. Aviation fuel is pumped up from the tanks below to the aircraft. Bombs and missiles are brought up from the magazines and loaded. Planes are then positioned on steam catapults that can accelerate a 37-ton jet to 140 MPH in about 250 feet and in less than three seconds. When landing, two-inch thick arresting wires connected

to hydraulic rams below the deck drag 150 MPH jets to a stop in less than 400 feet.

My son Greg is a flight officer on board an E-2C Hawkeye. This is a twin-engine turboprop aircraft, which carries a five-man crew. It is used to provide strike and traffic control, area surveillance, search and rescue guidance, navigational assistance, and communications relay in areas hundreds of miles from the carrier.

One of the highlights of the week was an air power demonstration in the middle of the Pacific. It included:

- Watching planes being fired off the catapult.
- Low level flybys of F-14 Tomcats and F-18 Hornets breaking the sound barrier at over 700 MPH.
- Flybys of all the different types of aircraft on the ship.
- A-6E Intruders creating a "wall of water" with 500 pound bombs.
- Air to air refueling demonstrations.
- F-18 Hornets doing strafing runs on the ocean with their cannons.
- Support ships firing their large guns.
- SH-60F Seahawk helicopters dropping and picking up swimmers from the ocean. During the week activities and demonstrations were going on every day. One evening there was a boxing *smoker* on the hanger deck. We had about twenty-five bouts between the sailors, with around 2000 spectators. All this while sitting amongst some of the most spectacular aircraft in the world.

Saturday afternoon we had a "Steel Beach Picnic" on the flight deck. This included hot dogs, football games, kite flying, a talent show, driving golf balls into the ocean, and sailors sunning themselves in tiny wading pools. For you golfers the record golf drive off the ship is seven miles (straight down) There was the opportunity for skeet shooting off the fantail, shooting 45 cal pistols off the elevators, and firing a 50 cal machine gun. Evenings were spent in the squadron ready-room watching old John Wayne Navy films, eating popcorn, and listening to war stories.

The week on the carrier was the adventure of a lifetime for me. Every day brought new experiences. It was also a chance for the sailors to wind-down after spending six months in the Persian Gulf patrolling the no-fly zone over Southern Iraq. During flight operations their workdays are 12 to 20 hours long, seven days a week, in 120-degree temperatures. This memorable week ended for me on October 9th with the Lincoln going under the Golden Gate Bridge and entering San Francisco Bay. This trip was a marvelous opportunity for me, and being able to share it with my son made it even better.

Happy Landings, Dave

Classifieds

Cessna 172

1957 CESSNA 172 \$26,500 SEE PHOTO UNDER EAA 113 MEMBERS SECTION. Contact Don Moore at PH. 810-227-3070 or via E-MAIL dmoore@seiberkeast.com

Powered Parachute

2001 Harmening High Flyer Executive, Two seater, 65HP two stoke, Fuel injected, Hirth Engine. Electric start, Three-blade propeller, 3 (**yes THREE**) hrs. Total Time: Airframe and Engine. Altimeter, CHT, EGT, Tiny Tach, Wheel pants, and Open Trailer contact **Jim Trick 248-543-8917**

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SECRETARY'S Scribbles



Bob Wagner (313) 274-8292
wagner16@mindspring.com

CHAPTER 113 MEETING MINUTES

Meeting Date: August 19, 2004
Number of Members Present: 46

Meeting Time: 7:30 PM

President Dave Buck welcomed new Member Craig Sawka and returning member Bob Hall. President Dave announced that the new chairs are still on order and welcomed donations of \$45.00 per chair in return for placing the member's name on the chair. Dave also announced that the CPR class is scheduled for 8-24 and 8-31- 2004. Space is available for two more people.

Dave McKenzie read the official invitation to the corn roast at his McKenzie's Landing on the afternoon of 8-28-2004.

President Dave announced new donations of equipment to the Chapter:

Pancake mixer donated by Craig Sawka

Drill press donated by Mike Scovel

Stand for the sheet metal brake by Howard Gilmore.

President Dave thanked Nick Forsman for arranging the miniature golf outing last month. Tom Sobota gave Bald Eagle rides in his RV-6 Last Sunday.

Frank Bitonti reported that a 36-passenger bus would be used for the trip to the Air Force Museum on 8-28-2004. 4 seats are still available. The bus will leave Mettetal airport at 6 AM sharp. President Dave thanked Frank for his work in organizing this trip.

Frank Bitonti also reported that he tried to start the engine on his restored Tailwind. Unfortunately, it backfired due to a timing problem and busted the starter clutch. He will try again after repairing the starter.

Your Secretary brought in, for show and tell, the failed left landing gear strut from his Mustang II. He noticed the left wing increasingly drooping. After disassembling for inspection, the strut was found to be cracked and bent. The strut was replaced with a new part.

President Dave thanked Leslie Farr for volunteering to be the new Membership Chairman. Bill Brown thanked the Chapter for supporting the Canton Rotary rummage sale last Saturday. He said one of the Rotary projects would be a fundraiser for new Chapter tables.

Guest Speaker: Shunsuke Shabata Topic: Video photos of Oshkosh 04

The presentation consisted of approximately 400 photos, including many telephoto close-ups of aircraft in flight.

Recorded by: RC Wagner, Secretary

From the Editor

Many thanks have to go out this month to all the contributing authors. Dave Buck, Nick Forsman, and Bob Wagner. Thanks to all the disk of photos from so many of you, I am thinking of a special e-mail issue just to highlight some of these great shots!

This month's issue has a lengthy article about Alan Shaw's Atlantica. Although on my recent trip to Florida I was unable to visit the project, I have been in contact with Alan via e-mail as well as a member of the e-mail list. I hope you enjoy reading about this fascinating aircraft as much as I have enjoyed writing about it.

Best regards,
Anthony J. Liberatore

LUCKY OR WHAT

By: Nick Forsman

At 16, I have figured out the secret to life: “It’s not what you know, but who!” On July 28th at Oshkosh, I was lucky enough to go on a ride with the Aeroshell Flight Team. It all started when Dave James hooked me up with one of his clients, Brian Mitchell (who happens to work for Aeroshell) that could hook me up with the pilots and get me a ride in the T-6’s. This was all a return for being able to solo on my 16th birthday. The pilots thought that was the coolest thing, besides, they did it too!!

Wednesday came around and I went to the place where they told me to wait. I was walking up to the bench about a few minutes early just as they taxied away . . . without me!! After trying to recover from the disappointment of missing them, they finally came back. That was such a relief. Brian introduced me to the pilots and we walked over to the airplane. Number 3 pilot, Steve Gustafson, handed me my parachute explained to me on how to bail out. He just said, “If you see me jump out, you should do the same!”

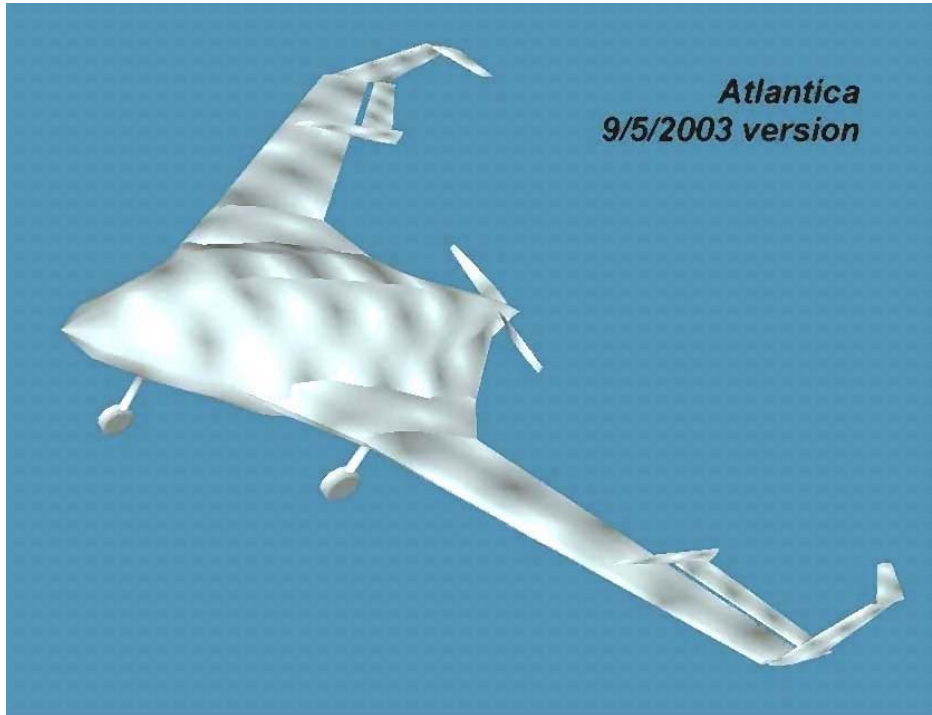
We took off in formation, climbed out in formation and didn’t leave formation until we turned final. Our wing tips were between 18-24 inches apart. We went out to the other side of Lake Winnebago and did some loops and rolls and various maneuvers. It felt cool to go upside down; however, it was a bit weird to have the ground above your head! I was able to get some cool pictures even though my little disposable camera felt like it weighed 90 pounds! I came down and I couldn’t stop talking about it for the rest of the week. I later learned that three of the four pilots have farms down south, and the fourth owns an air cargo business. The pilot I flew with has 22,000 hours! I wonder if my mom would let me join them one day???? Thank you to Dave, Brian and Steve for making yet another dream come true.



Edge Of the Envelope ©

Atlantica, Shape of Wings to Come. ©

By Anthony J. Liberatore



Computer Model of Atlantica and its latest configuration

I cannot help but wonder if it is Déjà vu all over again. It wasn't that long ago many of us were stunned to see on the cover of "Air Progress" a small bird known as the Vari-Eze. It's construction technique; use of the latest aerodynamics such as the GAW Airfoil, Winglets and the Canard Configuration, stunned us all and made many dreamers want one very bad. And get one they did, many were built as well as its follow on sister the Long Eze. However, in a hangar in the balmy Melbourne Florida there is an aircraft that I cannot help but wonder may end up repeating the same phenomenon. This aircraft's name is Atlantica. For those of you not familiar with the project Atlantica, it is a 4 place Blended Wing Body Aircraft of all composite construction and is the brainchild of Alan Shaw.

Alan's background may not be familiar to many of you, but he is one of the original team members in the Velocity Aircraft. Since leaving the Velocity Program, Allan has developed a proprietary composite construction technique that Atlantica utilizes in its construction. At an Air Show (of all things ☺) he was discussing with an individual this technique. This individual mentioned that this technique may lend itself well to some advanced work being done that could not be discussed however he did mention the Blended Wing Body (BWB for short) configuration to Alan. While testing iterations of designs concepts within aero software programs, Alan tested the BWB configuration and was stunned by the efficiency gains over all other configurations. It was then that he decided to proceed with a BWB design.

As some of you may be aware, the Blended Wing Body is credited to McDonald Douglas (before it was bought by Boeing) but its origins can be traced back to the work done by the Horten Brothers in Germany. It should be noted that almost all major airframe manufacturers and universities are or have investigated the configuration. The configuration is an attempt to eliminate fuselage drag, Increase L/D, Create a large capacity airliner that would take the footprint off the current "Heavies", and distribute the load of the passengers more evenly along the span to make it a more efficient "Span-Loader". The selling point of this configuration that has everyone's attention is that the drag is projected to be in the area of 32% less, with that in mind the fuel savings could be huge. Although no full-scale airline type BWB aircraft currently exist, Universities such as Stanford University have flown some large-scale models. Atlantica is the only General Aviation aircraft of this configuration at this time. The current Prototype is a 4 seater powered by a 235 Hp LOM inverted inline 6.

In the design process Alan utilized a great deal of aero-software to help develop the Atlantica. For instance, not satisfied with available airfoils, Alan design a series of Laminar Low pitching moment airfoils for this application with sections along the span tailored to the given Reynolds Numbers at a given station. While Atlantica utilizes a "Bell-Curve" span loading as found in the Horten Brothers designs, one of Alan's team members came up with the concept of using a less cambered almost inverted airfoils out near the tip to take the place of the large washout typically utilized in tailless swept wing designs such as

developed by the Horten Brothers. It is surmised that this will also reduce wingtip vortices for even greater efficiency. Another unique feature is that the center section has some reflex to help maintain a positive angle of attack at cruise and Alan analogizes this to all successful vehicle utilizing a form of trim or “toe-in” to help the vehicle track in a straight fashion. To truly understand some of the features of the design configuration, read what Alan Shaw has to say about it in his own words:

“The swept back wing tips always pull down. This is the key to the “Bell Curve” span loading and how Blended Wing and Body (BWB’s) aircraft work. The “see saw” is balanced the same as conventional aircraft which require the addition of an aft wing (and drag) to pull the tail down. Understanding what happens when the pressures are reversed at the wing tip is the heart of this debate. As the elevons are deflected upward the angle of attack increases across the whole span reducing the downward force at the aft wing tips causing the nose to return to Alfa zero when the stick is released. This is proof of pitch stability. Those who persist on rigging swept winged and all winged aircraft with “Elliptical Span” loading, which produce lift all the way to the wing tip, will realize instability on all three axis. The dihedral effect of a swept wing produces excessive roll stability at high Alfa. Roll stability produces yaw stability. Good swept wing designs have antihedral to destabilize some what such that ample roll and yaw agility is regained for cross wind landings. Antihedral also has the benefit of more efficiency at cruise speed. The “Bell Curve” does several things for swept all winged aircraft. By reversing the pressure differential at the wing tips vortex drag and span wise flow are minimized. The lift and drag coefficients are much higher in the center of the aircraft than an elliptically loaded plan form so a fuselage with wing intersections (a tube with wings) would result in little lift and high drag in this area. BWB’s take advantage of the bell curve high mid wing loading with an airfoil center section and a blended no intersection transition to the outer wing panels.”

After the Prototype was finished, one unique method aspect of the testing program was to mount Atlantica on a trailer and tow the entire assembly behind a pickup truck on aircraft runways. On the Atlantic

Website www.wingco.com, you can view movies of the tests (in Atlantica’s original configuration), including the high alpha test. In January 2003 during the flight test program with Allan as PIC of Atlantica, an incident occurred that has delayed the programs progress. During an attempted takeoff, an over control resulted in a pitch up / pitch down scenario that resulted in a very hard landing that damaged the Atlantica Prototype. What is interesting is that even with the setbacks of the hard landing of the Prototype, all is not lost. It wasn’t the stability or control of Atlantica’s configuration that was at fault, but pilot error. In fact, while “flying” Atlantica within aero-simulation software, Allan was able to replicate his incident many times, and he is convinced it was his technique that lead to the eventual outcome.



Atlantica undergoing trailer test preparations (original configuration)

In fact what was learned from this incident may in fact have Allan and his team way ahead of NASA and all the other researchers investigating the BWB Configuration in the opinion of this author. From this incident a problem of trailing edge boundary layer flow separation came too light. The solution they have chosen may again be truly innovative by

moving the long span narrow chord elevons off the wing and mount a shorter narrow chord elevon aft and slightly above the wing, a-la Junkers. These elevons may also act as “feathers” to dissipate the vortices much like an eagle or pelican will spay their wing tip feathers to reduce vortices. Also contributing to the reduction in vortices are the C-Wings. (If you look at 1st photo the C-Wings are the horizontal aft sweeping surfaces atop the Winglet).

The C-Wing is the brainchild of a Dr. Ilan Kroo and his students Stanford University. Some of you may not recognize the name but Dr. Kroo is the father of the Swift, the High Performance foot launched Glider. The C-wings came about as Dr. Kroo challenged his aero students to design a wing with greater efficiency than a given start point, which was a Long-Eze wing. Through computer design iterations the C-Wing was born. What they do is quite amazing. **Case in point, your current wing with slight dihedral has a lift coefficient of 1.03, with C-Wings the lift coefficient is 1.46.** One of the original concept applications of the C-Wing was to apply them to an existing airliner configuration on top of large winglets to eliminate the entire tailplane. While this configuration at this point has not gone any farther than artist conception, C-Wings have been applied to a few R/C aircraft and to Team Atlantica’s 1/7th Electric Model of the Atlantica. Alan notes in the Atlantica e-mail list that the addition of the C-Wing to 1/7th scale model had a dramatically positive effect on the landing characteristics and that it will now spoil you in how well it lands. When Atlantica’s C-Wing configuration is added to the Atlantica prototype, not only will it be the 1st man-carrying craft with C-Wings, but Atlantica’s C-Wings will also utilize trim tabs to assist in the landing configuration, another 1st.

So where is the program at this time and where is it headed? After the incident the program has come under some financial strain. At this time the goals are to proceed with a 1/6th scale model, a 1/3rd scale model, as well as to resume work on the full sized prototype hopefully within the next few months. At present a few Atlantica enthusiast have pledged funds to assist Team Atlantica to get Atlantica flying. While much headway has been made in reaching the funding goal the goal has not been met. The Prototype will be repaired and the new wings with the new elevon and C-Wings configurations installed. The landing gear will be relocated forward since its original aft mounted location was a

contributing factor to the original incident as well. A flight test program as been developed and a Test Pilot will be utilized to keep a fresh perspective on flying the aircraft vs. having the designer fly it, which makes a lot of sense.

In the opinion of the author, I have no doubt Atlantica will fly and its performance may well stun the critics. What is being attempted here are a number of 1st. Proprietary Construction Technique, The 1st Gen Av BWB, Custom Airfoils, C-Wing utilization, Unique Elevon configuration, and less cambered sections at the tip to name a few. The combination of all aerodynamic features mentioned in this article (and more) may well in fact lower the drag and increase the fuel economy of Atlantica to springboard it light years ahead of even the slickest homebuilt. In light of current and potential future fuel prices the cost associated with burning this fuel has definitely shown up on many pilots radar screen and they may in fact be looking for alternatives to high GPH figures. This configuration may be a “disruptive technology” to General Aviation since it will be hard to say no to the potential fuel savings of the configuration. If that wasn’t enough of a change, consider a slightly larger wing span cousin powered by a Small Turbofan such as the Williams FJ-33. The performance of such an aircraft as noted on Wingco’s website it eye-opening. With the “Very Light Jet market” just on the horizon, a Turbofan Atlantica has the potential to be a solid contender in this arena as well



Scale Model of Williams FJ-33 Powered Atlantica

America has always been a country of visionaries that have been willing to take risk and dream big and reach for their goals. Success or Failure, Men like Burt Rutan, Sam Williams, have laid it on the line to better themselves and what they are passionate about. As one of the Rutan Brothers have said, If we were not willing to take risk we still would be looking at the a\$\$ of on Ox. With a little luck and help from visionaries like Alan Shaw and Company, we will be looking at Oxen from "Flight Levels" and as small dots as we pass them at an amazing speed.

All Atlantica photos are courtesy of Wingco. Special thanks to Alan Shaw for a technical review of this article before publishing.

For more information on Altantica, the website is: www.wingco.com

To subscribe to the Atlantica's E-mail list go to:
www.wingco.com/mail_list.htm



Thanks to all Chapter members for these great photos!