



# Newsletter

Volume 37, Number 2, October 2006

## Design Characteristics for Replacement of 737's and A320's

*John Swihart*

This presentation will define several desired characteristics for commercial air transports specifically designed to replace Boeing 737's and Airbus A320's currently operated by low cost carriers such as Southwest Airlines, Jet Blue, RyanAir, and Easy Jet.

This new family of airplanes will employ the latest composite technologies, engines equivalent to the Genx and Rolls Royce Trent, cruise at  $M = 0.9$ , fly non-stop point-to-point schedules, maintain cabin pressure at sea level at all times with nearly germ free ventilation systems, contain quiet interior and exterior noise characteristics, and have low fuel burn per passenger and per mile.

These attractive features will result in continuing the low fares offered by the low cost carriers, passenger interiors will be attractive, and the appeal to low cost carriers will help them continue their expansion rates. Low cost carriers' current profitability makes them a primary force in the selection of the next new family of transport airplanes.



Left: Airbus  
A320-Air France

Right Top: Boeing  
737-900ER

Right Middle:  
Airbus A320-  
Swiss

Right Bottom:  
Boeing 737



### AIAA Lecture - Dinner Meeting

**Date:** Tuesday, October 17, 2006  
**Place:** Azteca Mexican Restaurant  
150 112th Ave NE  
Bellevue, WA  
**Time:** 6:00 PM Doors Open  
6:30 PM Dinner Begins  
7:00 PM Presentation Begins

**Dinner Price:**  
\$20 AIAA/SFTE Members and Guests  
\$25 Non-Members  
\$5 Students and Educator Associates  
\$5 Program Only

*A reservation is a commitment to pay.*

#### Reservation Option Via Section Website

AIAA members can sign up online at [www.pnwaiaa.org](http://www.pnwaiaa.org) or send an e-mail to [reservations@pnwaiaa.org](mailto:reservations@pnwaiaa.org). A confirmation e-mail will follow.

## **AIAA ANNOUNCES 2007 ASSOCIATE FELLOWS**

The 2007 Associate Fellow Grade Committee met in August 2006 and selected 185 members for upgrade to Associate Fellow. The Membership Committee approved all nominees.

The requirements for Associate Fellow as stated in the bylaws are as follows: Associate Fellows may be nominated by any AIAA member in good standing and shall be approved by the Membership Committee; a maximum of one Associate Fellow per every 150 voting members may be upgraded annually; nominees must be AIAA Senior Members and have at least 12 years professional experience; nominees must be recommended by three members in good standing of Associate Fellow grade or higher.

The 2007 Associate Fellows will be honored at the AIAA Associate Fellows Dinner on Monday, 8 January 2007. The dinner will be held at the Grand Sierra Resort (formerly the Reno Hilton Resort), 2500 East Second Street, Reno, NV 89595, in conjunction with the 45th AIAA Aerospace Sciences Meeting and Exhibit.

Congratulations to PNW members Timothy Bressler and Paul Bolds-Moorehead, both of the Boeing Company.

### **Senior Member Upgrades**

Congratulations to the following PNW members who have been upgraded to the level of Senior Members:

Reiner J. Kraft

Frank Lu

Eduardo A. Rodrigues

### **AIAA Professional Development**

If you are looking to advance your career and enhance your professional expertise, AIAA Professional Development is your best choice! For more information or to register today, go to [www.aiaa.org](http://www.aiaa.org) and click on Courses & Training.

#### ***Tactical Missile Design Course***

12 - 13 Nov 2006

Hyatt Regency Monterey

Monterey, CA

This self-contained course is based on the AIAA textbook *Tactical Missile Design*. It provides a system-level, integrated method for missile aerodynamic configuration/propulsion design and analysis. Available are a broad range of alternatives in meeting performance, cost, measures of merit, and launch platform integration requirements. Methods presented are simple closed-form analytical expressions that are physics-based, to provide insight into the driving

parameters. Typical characteristics of current missiles are discussed. Because this two-day course is less than 5 day duration, the attendees will vote on the priority emphasis within the time available. Configuration sizing may include rocket, ramjet, and turbojet-powered missiles. Also available are discussions of enabling subsystems and technologies, the development process, and the current/projected state-of-the-art of tactical missiles. Over thirty videos illustrate missile development activities and missile performance. Finally, each attendee may design, build, and fly an air-powered rocket that illustrates the course design methods.

### **Distance Learning Courses**

**Introduction to Computational Fluid Dynamics**

30 Nov - 30 Apr 2007

This comprehensive, three-part series of courses will prepare you for a career in the rapidly expanding field of computational fluid dynamics and fluid turbulence. Completion of these three courses will give you the equivalent of one semester of undergraduate and two semesters of graduate work. The courses are supported extensively with textbooks, computer programs, and user manuals. You can use the computer programs to develop your own codes, or you may modify the existing codes for assigned applications. You will need access to a computer with a PC Pentium processor, FORTRAN compiler, and graphics package for the software applications. A fundamental knowledge of computer programming and familiarity with a basic graphic package are required.

#### ***Advanced Computational Fluid Dynamics***

30 Nov - 30 Apr 2007

The aim of this course is to extend the concepts of numerical schemes to a system of equations typically expressed in a vector form. The content of this course is equivalent to a one-semester graduate course. Furthermore, you must have had an introductory course in CFD, e.g., the AIAA Introduction to Computational Fluid Dynamics Course. Access to a high-end PC, workstation, or a mainframe computer, along with a FORTRAN compiler and graphics, is necessary for applications. This comprehensive course will prepare you for a career in the rapidly expanding field of computational fluid dynamics and fluid turbulence.

#### ***Computational Fluid Turbulence***

30 Nov - 30 Apr 2007

A course in intermediate/advanced CFD and a course in fluid mechanics at upper division undergraduate or graduate level are required. Access to a high-end PC, a workstation, or mainframe computer, along with a FORTRAN compiler and graphics package, is necessary for applications. This comprehensive, three-part series of courses will prepare you for a career in the rapidly

expanding field of computational fluid dynamics and fluid turbulence. Completion of these three courses will give you the equivalent of one semester of undergraduate and two semesters of graduate work. The courses are supported extensively with textbooks, computer programs, and user manuals. You can use the computer programs to develop your own codes, or you may modify the existing codes for assigned applications.

## UW Microgravity Team Arrives at Kennedy Space Center

The University of Washington microgravity team arrived in Florida in early August to complete an experiment with the Zero Gravity Corporation...unfortunately, their experiment did not.

With the support of the PNW AIAA, the Students for the Exploration and Development of Space (SEDS) organized a joint research and outreach project to study fluid mechanics and promote math and science to local high schools. The outreach portion was initiated last October as a competition for Washington high schools to submit proposals for their own microgravity project. The winner, Pasco High School, was able to send two students and their teacher into parabolic flight and experience weightlessness with a project of their own. The research portion was to study generalized Rayleigh-Taylor flow as a follow-up from previous testing done with NASA's Weightless Wonder two years ago by team lead Jeffrey Boulware.

Sadly, neither experiment made it onto the Zero-G's Boeing 727. Aside from arriving four days late and encountering severe damage during shipping, only two of the three packages arrived. "It's a month later and we still don't know where half of our experiment is," says Boulware. Despite missing components, Boulware

and his fellow university flyers, Michael Frostad and Anna Askren, found a way to salvage their experiment and retrieve data. They and their high school counterparts, students Stephanie Garcia and Ariel Hale and teacher David Hege, worked around the clock to repair and regain an entire year's worth of work. "I think it showed a lot of character that they worked until 4 in the morning and then were awake by 5. It also showed a very dedicated teacher," comments Boulware. Upon arriving at the hangar with experiments intact, more bad news awaited.

Because the plane had already been signed off without the heavy equipment, the students were forced to leave their projects behind. Nonetheless, all six were allowed to fly and float in microgravity without the research. "Despite the delays and setbacks, the project was a success, because of the lessons learned and the difference made," says Boulware.

The flight was touted as the first parabolic research flight out of Kennedy Space Center and operated from the Shuttle Landing Facility. While at KSC, the students also enjoyed a tour of the space center as arranged by another major sponsor, Andrews Space of Seattle. The tour which included SRB loading, the Vehicle Assembly Building (VAB), Mission Control Center, and finally, a visit to Space Shuttle Atlantis on the launch pad. "We got to walk out the gangway that the actual astronauts walk out on!" adds Frostad.

The students are filing a claim with the shipping company and will attempt to raise funds for another flight. "Currently no other SEDS chapter has a structured high school outreach program set up," said Boulware. "We feel outreach should be an integral part of the chapter and by establishing an annual program, we're hoping to set an example to other SEDS chapters across the nation." Let's hope they do.



<b>2006-2007 PNW AIAA Calendar</b>	
<b>Monday to Tuesday, October 16-17</b>	
Event:	NATO Lecture Series: Nanotechnology
Location:	University of Washington, Seattle, WA
<b>Tuesday, October 17</b>	
Event:	PSEC Mentor Night: Seattle University
Location:	Seattle University, Student Center 160A&B Seattle, WA
<b>Thursday, October 19</b>	
Event:	AMTAS Autumn Meeting
Location:	Edmonds Conference Center Edmonds, WA
<b>Tuesday, November 21</b>	
Speaker:	Russ Maguire-Boeing, Retired
Topic:	Nanotechnology in Aerospace
Location:	Old Spaghetti Factory <sup>2</sup>
<b>Saturday, December 16</b>	
Speaker:	Portland State Aerospace Society
Topic:	Portland State Rocket Program
Location:	Museum of Flight
<b>Tuesday, January 16</b>	
Speaker:	Tom Daniel-University of Washington
Topic:	Bug Flight
Location:	Museum of Flight
<b>Tuesday, January 23</b>	
Event:	PSEC Mentor Night: University of Washington
Location:	University of Washington, McCarty Hall Seattle, WA
<b>Tuesday, February 20</b>	
Speaker:	Roger Launis
Topic:	Apollo: The Thrill of a Lifetime
Location:	Old Spaghetti Factory <sup>2</sup>
<b>Saturday, February 24</b>	
Event:	PSEC Engineering Fair
Location:	TBD
<b>Tuesday, March 20</b>	
Speaker:	TBD
<b>Tuesday, April 17</b>	
Speaker:	TBD
<b>Tuesday, May 15</b>	
Speaker:	Paolo Feraboli-University of Washington
Location:	Azteca <sup>1</sup>
<sup>1</sup> Azteca	<sup>2</sup> Old Spaghetti Factory
150 112 <sup>th</sup> Ave NE	2801 Elliott Ave
Bellevue, WA	Seattle, WA
<b>2006-2007 Retired Members Brunches</b>	
<b>Saturday, November</b>	
Speakers:	Harry Higgins & Dick Tayler
Topic:	B-47
<b>Saturday, May</b>	
Speaker:	Bob Bogash
Topic:	Caretaker of the Original 737: The Last 30 Years
All Retiree meetings are held at the Museum of Flight, Seattle, WA.	

## NASA Announces New Student Aeronautics Competition

NASA's Aeronautics Research Mission Directorate, Washington, announced a new aeronautics competition for high school and college students. The competition is sponsored by the directorate's Fundamental Aeronautics Program, and it is part of NASA's mission is to inspire the next generation of engineers, scientists, and explorers.

High School students are challenged to put themselves 50 years into the future to describe how air transportation systems have evolved with vehicles flying at various speeds. Entries are due by March 15.

College students are invited to propose solutions for complex technical problems in hypersonic and supersonic flight; subsonic fixed and rotary wing transports; or Mars entry, descent, and landing. College entries are due by April 27.

Monetary awards ranging from \$1,000 to \$5,000 may be available for first place winners in each category. There will be awards for second and third places and honorable mention recognition. Winning university students may be offered a 10-week summer internship at a NASA field center.

For details about this competition, visit:  
<http://aero.larc.nasa.gov/competitions.htm>

For information about other aeronautics competitions, visit:

[http://www.aerospace.nasa.gov/design\\_comp.htm](http://www.aerospace.nasa.gov/design_comp.htm)

For information about NASA and agency programs, visit:

<http://www.nasa.gov/home>

## AIAA 75 Years

*In honor of our 75<sup>th</sup> anniversary, the following series will cover the Institute's history. The entire series can be read on the AIAA website.*



### The IAS – Later Years (1945 to 1963)

In 1946, the IAS headquarters moved to the former Berwind Mansion, on East 64th Street in New York, including a Reading Room that was open to the public. Much of the IAS collection was then able to be put on display, and there was even a museum there for a period of time.

By this time, Lester Gardner was 70 years old, and had administered the Institute for 14 years. His successor, Samuel Paul Johnston, a former World War I Army aviator and engineer, became the new Executive Director in April, 1946. Also that year,

the IAS held seven national meetings, having had to curtail them during the war years.

Over the next few years, the IAS built two buildings on the West Coast, in San Diego and Los Angeles. The Western Office and the Pacific Coast Library were there, and they also rented the space to the NACA, California Western University and other companies.

Under Paul Johnston, the IAS continued to gather technical information, but began to face the challenge of how to keep track of the ever-growing volume of literature. An index of the latest technical articles in the field, covering 33 periodicals, had been published in the Aeronautical Engineering Review since 1936, but Johnston thought there might be a better way to organize the information. A consultant suggested that the IAS take the lead in the business of indexing and abstracting, and the IAS received a contract from the Army Air Force to develop a Standard Aeronautical Index. The contract produced a thesaurus of terms and list of categories that would be used by all U.S. aeronautical abstractors. In 1954, the IAS created International Aerospace Abstracts, funded by NASA.

By 1958, the IAS began to see a drop in membership. Aeronautics, which had been a leading technology, now seemed archaic. Between 1954 and 1964 there was an immense shift in the emphasis from aviation to space, and the term "aerospace" started to be used more and more. To keep up with this shift, the IAS changed from the Institute of the Aeronautical Sciences to the Institute of the Aerospace Sciences, and the Journal of the Aeronautical Sciences became the Journal of the Aero/Space Sciences

## 2006-2007 PNW AIAA Council Members

Mark Viviano - Secretary-Elect



Born in New Jersey and raised in California, Mark Viviano attended the California Polytechnic State University, San Luis Obispo where he earned a B.S. in Aerospace Engineering in 2005. After

graduating from Cal Poly he started work at Boeing Commercial Airplanes in Renton. For the last year

he has been working as an aerodynamics analyst in the Flight Manuals and Performance Tools group and will soon be rotating into Sales Support. When not at work he enjoys reading, working on models, exploring the areas surrounding the Puget Sound, and taking things apart. He has been a member of AIAA since 2001.

Jim McClelland – Treasurer Elect

Jim graduated from Oklahoma State University in



1980 with a BSME Aeronautical Option. At AIAA North Texas section he served as Secretary and Treasurer. Currently assigned to 787

in the Structural Methods and Allowables engineering group he has worked at Boeing about 6 years as a contract engineer and at various other companies including Lockheed, Beech, Piper and Sikorsky.. With a little over 1100 hours of flying time he obtained his private pilot license during his senior year in high school and currently holds a Commercial Instrument and Multi-Engine flight instructor ratings. Jim is a senior member of AIAA with continuous membership since 1986.

## Recruiting New Members

Share the value of AIAA membership with a colleague and earn a bonus through the AIAA Referral Program. Encourage colleagues to take advantage in participating in Section activities. Mention networking opportunities and AIAA's vast technical resources. Spread the word on how AIAA involvement can work to benefit them and their career.

A \$5 bonus will be issued that can be spent in the AIAA online Store for every new member that they recruit! This bonus can also be applied to conference and course registrations, publications and journal subscriptions, or even to renew your own membership.

To find out how you can participate, visit [www.aiaa.org/referral](http://www.aiaa.org/referral).

Section website: <http://www.pnwaiaa.org/>  
 National website: <http://www.aiaa.org>

Please submit newsletter materials to the editor by the 25th of October for the November newsletter.

A PUBLICATION OF AIAA THE PACIFIC NORTHWEST SECTION  
**Address Corrections**

Send to: **AIAA**  
**1801 Alexander Bell Dr.**  
**Reston, VA 22091**

Now make corrections on-line at  
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## Section Officers and Directors

Position	Name	Address (Mail stop if Boeing*)	Phone	Email address
<b>Council</b>				
Chairman	Paul Kostek	6M-EU	-	kostek@pnwaiaa.org
Vice-Chairman	Scott Eberhardt	-	-	eberhardt@pnwaiaa.org
Secretary	Jon Lee	02-XJ	-	jonathan.p.lee@boeing.com
Treasurer	Chris Nelson	6712 183 <sup>rd</sup> St. SW, Lynnwood, WA 98037	-	ccnelson@comcast.net
Advisory Council	Bonnie Dunbar	-	-	bdunbar@museumofflight.org
Advisory Council	Ratan Khatwa	-	-	Ratan.Khatwa@Honeywell.com
Advisory Council	TBD	-	-	-
Advisory Council	TBD	-	-	-
Past Chairman	Dave Lednicer	2133 152nd Ave NE, Redmond, WA 98052	425-643-9090	dave@amiwest.com
<b>Elected, non-voting</b>				
Vice-Chairman-Elect	Steve Runo			
Secretary-Elect	Mark Viviano			
Treasurer-Elect	Jim McClelland			
<b>Appointed</b>				
Webmaster	Andrew McComas	2133 152nd Ave NE, Redmond, WA 98052	425-643-9090	mccomas@amiwest.com
Honors & Awards	Scott Eberhardt	-	-	eberhardt@pnwaiaa.org
Retired Members	Tom Holgate	2704 SW 314th, Federal Way, WA 98023-7842	253-838-0333	holgatz@aol.com
Newsletter	Emmanuel Domingo	03-JP	-	domingo@pnwaiaa.org
Nominations	Vera Martinovich	02-XJ	425-266-8664	vera.a.martinovich@boeing.com
Museum of Flight Liaison	Charles Beard	-	-	-
Pre-College Outreach	Scott Eberhardt	-	-	eberhardt@pnwaiaa.org
Public Policy	Karl D'Ambrosio	5026 18 <sup>th</sup> Avenue NE, Seattle, WA 98105	253-395-3710	karld@emfcowa.com
Young Professionals	Emmanuel Domingo	03-JP	-	domingo@pnwaiaa.org

\* All Boeing people have the address of P.O. Box 3707, Mail Code xx-xx, Seattle, WA 98124-2207



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