AIAA Career Enhancement
Aircraft Technology & Operations
The Reno 2005 Experience…

Where am I now? Where am I going?

Sat, 1/8, 5pm

Sat, 1/8, 6pm

Sun, 1/9, 12 noon
AIAA Career Enhancement
Propulsion & Energy

Where am I now? Where am I going?
AIAA Career Enhancement
Structures, Design & Test

Where am I now? Where am I going?

SSBD WTM-2 Near-Field Pressures
M = 1.367, C\text{N} = 0.132, h/L = 1.5, \phi = 0^\circ

Along Track (Model) - inches

\Delta P_{\text{local}} / P_{\text{local freestream}}

Euler - 24b WTM-2 @ MFR = 0.76

24b4 WT Data @ MFR = 0.76 - 0.80 - Rdg. 143 (P3)

24b4 WT Data @ MFR = 0.76 - 0.80 - Rdg. 157 (P4)

Extensive CFD

NASA Dryden
Feb 02
Inlet Shock Flight Test

NASA Glenn
Mar & May 02
Boom Tunnel Tests

Correlations Completed

Inlet Shock Flight Test

Force Tunnel Test

Mod Nose Attached

Fairings Attached

S&C Tunnel Test

AEDC 4T
Oct 02

NASA Glenn
Mar & May 02

First Flight Prep

Extensive CFD

Flight Ops Prep

First Taxi

First Flight

24 Jul 03

First Taxi
9 Jun 03

First Flight

24 Jul 03
What is our industry? Aerospace & Aviation

- National Security
- Defense – combat ac, missiles, navigation satellites
- Intelligence – air and space-based systems
- Civil (other Gov)
- Air traffic mgt, safety, environmental issues
- Weather satellites, ISS, Hubble, Spirit

- Commercial
- Aircraft manufacturing, air carriers, general aviation
- Satellite communications, remote sensing, launch

- 2,000,000 people in Aerospace (most in air transportation); 15 million jobs in the economy
- 15% to GDP; Largest trade surplus
- 600 million passengers; 150 million on GA; 50% personal travel
- 40% of freight is moved by air

Where am I now? Where am I going?
What is our industry?

- Corporations
- Government
- Academia
- International Opportunities
- Professional Associations
## AIAA Career Enhancement
### Industry Corporations

<table>
<thead>
<tr>
<th>Aerospace Company</th>
<th>Revenues ($ millions)</th>
<th># of Employees</th>
<th>Global 500</th>
<th>Fortune 500 (US only)</th>
<th>100 Best (US only)</th>
<th>Most Admired (Global 50)</th>
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<tr>
<td>Boeing</td>
<td>54,069.0</td>
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<td>Thales Group</td>
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</table>
Government uses aerospace engineers

- NASA
- DoD
- Commerce
- Transportation
- FAA
- Congress
- States
AIAA Career Enhancement
Academic Elements

Universities

- Embry-Riddle University
- Penn State
- University of Maryland
- University of Colorado (Boulder)

Continuing education programs

Is my degree current? Do I like to teach?

Where am I now? Where am I going?

Where am I now? Where am I going?
Move beyond our borders

- International Opportunities
  - Intelsat
  - Airbus
  - Europe
  - Asia
  - Latin America
  - Africa is the emerging market in the second half of this century

Where am I now? Where am I going?
Develop our skills

- Professional Associations
  - AIAA
  - IEEE Aero & Electronic Systems, Communications Society
  - Society of Automotive Engineers
  - American Society of Civil Engineers

Where am I now? Where am I going?
AIAA Career Enhancement
Aerospace Programs

What are the programs?

• Aeronautics
  • Joint Strike Fighter
  • F-22 Raptor
  • Quiet Supersonic Program
  • V-22 Osprey
  • Helicopters
  • UAVs of all sorts

Where am I now? Where am I going?
Current trends

Current situation for aeronautics

- Commercial needs now drive the aviation business
- Perception is that aeronautics is a mature industry, not “revolutionary” technology
- U.S. Commission on Aerospace – aerospace vital to national economy
- Aeronautics major positive factor in trade balance, but U.S. companies are losing ground
- EC investing heavily in aeronautics research with two full scale engine demonstration programs planned
- European Commission on Aerospace – Europe plans to dominate industry by 2020
- Airbus passed Boeing for market share
- Environmental factors related to noise, pollution & hazardous chemicals are becoming drivers that will affect aerospace systems

Where am I now? Where am I going?
AIAA Career Enhancement
Aerospace Programs

What are the programs?

- Astronautics
  - Space station
  - Earth Sciences
  - Mars missions
  - Commercial space

Where am I now? Where am I going?
Implement a sustained and affordable human and robotic program to explore the solar system and beyond

Extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations;

Develop the innovative technologies, knowledge, and infrastructures both to explore and to support decisions about the destinations for human exploration; and

Promote international and commercial participation in exploration to further U.S. scientific, security, and economic interests.
Identify Key Targets

Past and Present Water and Life; Testbeds and Resources

Underground Oceans, Biological Chemistry, and Life

Earth-Like Planets and Life

Key

- Planned Robotic Mission
- Potential Robotic Mission/Decision*
- Robotic Operations
- Planned Human Mission
- Potential Human Mission/Decision*
- Human Operations

* Earliest estimated date

NOTE: All missions indicate launch dates

Mars

Outer Moons

Extrasolar Planets

Robotic Trailblazers

Deep Impact Comet Mission
Stardust Comet Return
New Horizons Pluto Flyby
MESSENGER Mercury Orbiter
Dawn Asteroid Orbiter
Lunar Orbiter
Robot Landings

Human Missions To Moon

Human Landings*
Robotic Testbed Missions

Go Beyond

Moon

Mars

Robotic Landing Station Assembly Complete
Human Research Complete
CEV Operational
Orbital Tech Demos
Optical Comm Demo
Nuclear Power/Propulsion Demo
Station Assembly Complete
Human Research Complete
CEV Test Flights
CEV Operational
Optical Comm Demo
Nuclear Power/Propulsion Demo
Lunar Exploration Systems
Building Blocks

2000

2010

2020

Begin Exploration Systems/Heavy Lift Decisions
Station Transition
Space Shuttle Retirement
Soyuz and/or CEV
Station Assembly Complete
Human Research Complete
CEV Operational
Optical Comm Demo
Nuclear Power/Propulsion Demo
Lunar Exploration Systems
Building Blocks
AIAA Career Enhancement

NASA Budget for Exploration

“Sustained and affordable.”
-- “A Renewed Spirit of Discovery”
January 2004

Where am I now? Where am I going?

* Includes Lunar/Mars/Solar System Exploration and Origins
Where is my career?

- **Phase 1: College**
  - Internships, FE (EIT) exam, AIAA student

- **Phase 2: First Job (0 - 3 years)**
  - Learn job, graduate degree, AIAA member

- **Phase 3: Early Career (3 - 10 years)**
  - Specialize, licensing, AIAA senior member
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Career Timeline

Where is my career?

- Phase 4: Mid-career (10 - 22 years)
  - Technical vs management, AIAA committees
- Phase 5: Late career (22 - 40 years)
  - Executive positions, consulting, AIAA Fellow?
- Phase 6: Retirement (40 years)
  - Part-time consulting, AIAA leader

Where am I now? Where am I going?
Where do I go from here?

- Homeland Security is a growth sector
- Commercial space applications
- Increasing international ventures
- Strong competition for jobs
- Increased use of temporary firms

Where am I now? Where am I going?
How do I compete?

- Broaden your expertise
  - Information systems
  - Materials sciences
  - Management skills
  - Study a foreign language

Where am I now? Where am I going?
AIAA Career Enhancement
AIAA Activities

How can AIAA help?

- Regional and sectional activities
- Technical committees
- Conferences & Journals
- Continuing education courses
- Resume posting (www.aiaa.org)
- Aerospace America

Where am I now? Where am I going?
Where am I now?

Where am I going?

AIAA Career Enhancement Committee
AIAA Career Enhancement

Where do you want to be?
AIAA Career Enhancement Committee