

AHS International Specialists' Meeting

Unmanned Rotorcraft Systems



January 20-22, 2009
Chaparral Suites Resort
Scottsdale, AZ



Sponsored by the Arizona Chapter of AHS International

Final Program

Monday, January 19, 2009 • Evening

5:00 PM – 6:00 PM **Registration**

Tuesday, January 20, 2009 • Morning

7:00 AM – 8:00 AM **Registration**

8:00 AM – 11:30 AM **Session 1 – Invited Speakers**
Paloma I and II *Session Chair:* Larry Plaster, The Boeing Company

8:00 – 8:30 AM **Keynote Speech: US Army Aviation S&T for the Future**
Dr. James R. Snider, Associate Director for Aviation, U.S. Army AMRDEC

8:30 AM – 9:00 AM **Future Vertical Lift Capabilities Based Assessment**
James “Raleigh” Durham, Director, Joint Advanced Concepts, OSD (AT&L)

9:00 AM – 9:30 AM **UAS – PEO Aviation Update**
Layne Merritt, U.S. Army Program Executive Office

9:30 AM – 10:00 AM **Break – South Foyer Exhibit Area**

10:00 AM – 10:30 AM **Unmanned Aircraft Capabilities for the Future**
Col. Steve Kihara, Commander, U.S. Army AATD

10:30 AM – 11:00 AM **Unmanned Aircraft Program Office, Current Activities**
George Salmons, FAA Unmanned Aircraft Program Office, AIR-160

11:00 AM – 11:30 AM **Autonomous Air System Technologies Development at the Army Research Laboratory**
Dr. Mark W. Nixon, Director, VTD, U.S. Army Research Laboratory

11:45 AM – 1:00 PM **Lunch – Paloma III**

Tuesday, January 20, 2009 • Afternoon

1:00 PM – 4:30 PM **Session 2 – Invited Speakers**
Paloma 1 and II *Session Chair:* Dr. Ram JanakiRam, The Boeing Company

Tuesday, January 20, 2009 • Afternoon (Continued)

- 1:00 PM – 1:30 PM Applications of Intelligent Autonomy Technologies to Improve UAV Reliability and to Sense and Avoid Operations in Uncontrolled Airspace
Bob Williams, Aerospace Consultant
- 1:30 PM – 2:00 PM Cargo Unmanned Aerial System for Battlefield Logistic Support and Casualty Evacuation
Rafi Yoeli, Urban Aeronautics
- 2:00 PM – 2:30 PM The Necessary Role for VTOL Micro Air Vehicles (MAVs) in Advancement of Micro Autonomous Systems and Technology (MAST)
Dr. Daniel P. Schrage and Dr. Mark Costello, Georgia Institute of Technology
- 2:30 PM – 3:00 PM **Break – South Foyer Exhibition Area**
- 3:00 PM – 3:30 PM Autonomous Helicopter Research at the Army Aeroflightdynamics Directorate
Matthew Whalley, US Army AFDD
- 3:30 PM – 4:00 PM MAV Program Overview
Vaughn Fulton, Honeywell
- 4:00 PM – 4:30 PM A160T System Maturation for Military Missions
M. J. Adrianns, David Paul, Ben Ingram and Brad P. Gupta, The Boeing Company
- 5:00 PM - 7:00 PM **Cocktail Reception – South Foyer Exhibition Area**

Wednesday, January 21, 2009 • Morning

- 7:00 AM – 8:00 AM **Registration**
- 8:00 AM – 12:00 Noon **Technical Session 3 – Control and Autonomy**
Session Chair: **Thomas Altshuler**, Teledyne Scientific
- 8:00 AM – 8:30 AM On Flight Path Control of an Unmanned Helicopter in Forward Flight
Benton J. Derrick and Mike J. Spires, Dynetics Inc.
- 8:30 AM – 9:00 AM Vision-Aided Inertial Navigation by Sensor Fusion for an Autonomous Rotorcraft Vehicle
C. L. Bottasso and D. Leonello, Dipartimento di Ingegneria Aerospaziale, Politecnico di Milano
- 9:00 AM – 9:30 AM Unmanned Little Bird Command and Control
J. Graham, D. Caldwell, G. Dockter and D. Cerchie, The Boeing Company
- 9:30 AM – 10:00 AM **Break – South Foyer Exhibition Area**
- 10:00 AM – 10:30 AM Feasibility Studies for VTOL UAV Autonomous Operations with the Possibility of Shipboard Auto Recovery
Bernard Ferrier, David Ludwig and Fu Chen
Hoffman Engineering, Office of Naval Research and Northrop-Grumman
- 10:30 AM – 11:00 AM Aggressive Maneuvering for Obstacle Avoidance with Envelope Protection for Autonomous UAVs
Jongki Moon and Dr. J. V. R. Prasad, Georgia Institute of Technology
- 11:00 AM – 11:30 AM Local Terrain Mapping for Obstacle Avoidance Using Monocular Vision
Sean Quinn Marlow and Jack W. Langelaaan, The Pennsylvania State University
- 11:30 AM – 12:00 Noon Ground Based Sense and Avoid (GBSAA) Technology to Enable Unmanned Aircraft Flights in the U.S. National Airspace at Night
John A. Wade and M. Viva Austin, Dynetics Inc. and US Army AMRDEC
- 12:00 Noon – 1:00 PM **Lunch – Paloma III**

Wednesday, January 21, 2009 • Afternoon

- 1:00 PM – 5:00 PM
Paloma I and II
Technical Session 4 – Micro Air Vehicles
Session Chair: Mark Bundy, Army Vehicle Technology Directorate
- 1:00 PM – 1:30 PM
Development of Closed Loop Flight Control for a Shrouded Rotor Micro Air Vehicle with Anti-Torque Vanes
Vikram Hrishikeshavan and Dr. Inderjit Chopra, University of Maryland
- 1:30 PM – 2:00 PM
Experiments on the Optimization of MAV-Scale Cycloidal Rotor Characteristics towards Improving their Aerodynamic Performance
Moble Benedict, Dr. Inderjit Chopra, Manikandan Ramassamy and Dr. J. Gordon Leishman, University of Maryland
- 2:00 PM – 2:30 PM
Numerical Study of the Effect of Leading Edge and Trailing Edge Geometries and Planform on Micro Hovering Rotor
Vinod K. Lakshminarayan and Dr. James D. Baeder, University of Maryland
- 2:30 PM – 3:00 PM
Break – South Foyer Exhibit Area
- 3:00 PM – 3:30 PM
Mechanical Samara Deployment and Passive Distribution by a Fixed Wing Unmanned Air Vehicle
Evan R. Ulrich, Cyrus Abdollahi, Joe Park and Dr. Darryll Pines University of Maryland
- 3:30 PM – 4:00 PM
Numerical Methods for the Aeromechanical Design of Flapping Wing Hovering MAVs
G. R. Whitehouse, T. R. Quackenbush, A.H. Boschtisch and J. D. Keller Continuum Dynamics, Inc.
- 4:00 PM – 4:30 PM
Understanding Insect-Based Flapping FLIGHT from a Micro Air Vehicle Perspective
Pranay Seshadri, Moble Benedict and Inderjit Chopra University of Maryland
- 5:00 PM
SW Regional Lichten Competition – Paloma I and II
- 6:00 PM
Cocktail Hour – South Foyer Exhibit Area
- 7:00 PM
Dinner Banquet – Hacienda I and II
Featured Speaker: Philip J. Dunford
Vice President and General Manager, Boeing Rotorcraft
Boeing Rotorcraft – Adding Value to the Warfighter

*The Society thanks The Boeing Co.
for its generous support of the Banquet.*



Thursday, January 22, 2008 • Morning

- 7:00 AM – 8:00 AM
Registration
- 8:00 AM – 11:00 AM
Paloma I and II
Technical Session 5 – Design and Testing
Session Chair: Keith Arthur, U.S. Army AATD
- 8:00 AM – 8:30 AM
Unmanned Little Bird Testing Approach
M. Hardesty, D. Guthrie and D. Cerchie, The Boeing Company
- 8:30 AM – 9:00 AM
Conceptual Design of a Ducted Fan Based Vertical Takeoff and Landing Tactical Unmanned Aerial Vehicle
Jonathan D Keith and Ryan S Wood
Empirical Systems Aerospace and Frontline Aerospace Inc.
- 9:00 AM – 9:30 AM
The A160T VTOL UAS: Payload Integration, and Operational Experimentation
Thomas K. Berger and Brad Gupta, The Boeing Company

9:30 AM – 10:00 AM

Break – South Foyer Exhibition Area

10:00 AM – 10:30 AM

Unmanned Little Bird Analytic Tools

H. Tadghighi, D. Caldwell and D. Cerchie, The Boeing Company

10:30 AM – 11:00 AM

**Design Analysis of the Pericyclic Variable Speed Transmission
System for a 600HP Class Unmanned Rotorcraft**

**Zihni B. Saribay, Dr. Edward C. Smith, Robert C. Bill, Suren Rao and
K.W. Wang, The Pennsylvania State University and Univeristy of Michigan**

11:00 AM

Conference Closes

Thank you to our sponsors and exhibitors:

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AHS International

217 N. Washington Street
Alexandria, VA 22314-2538
(703) 684-6777 • (703) 739-9279 FAX
staff@vtol.org • www.vtol.org