Aerospace Testing Seminar

"Celebrating Four Decades of the ATS"

Sheraton Gateway Hotel Los Angeles

Oct. 16 – 18, 2012

Pre-Seminar Tutorials: Monday, Oct. 15

7:00 Registration/Continental Breakfast

8:00 Full-Day Sessions Part I (8 a.m. - 11:30 a.m., with a break at 9:35 a.m.)
Part II (1 p.m. - 4:30 p.m., with a break at 2:35 p.m.)

The Keys to Space Vehicle Integration and Testing - Parts I and II
Instructors: Bruce Arnheim, The Aerospace Corporation; Charlotte Belsick, Lockheed Martin Space Systems Company

Test Like You Fly (TLYF) - Parts I and II
Instructors: Julia White and Lindsay Tilney, The Aerospace Corporation

8:00 Morning Sessions (8 a.m - 11:30 a.m. with a break at 9:35 a.m.)

Introduction to SMC-S-016 (MIL-STD-1540E) Test Requirements for Launch, Upper-Stage, and Space Vehicles
Instructors: James Snyder and Al Peterson, The Aerospace Corporation

Pyroshock Testing
Instructor: Vesta Bateman, Mechanical Shock Consulting

Thermal Testing and Verification
Instructor: John Welch, The Aerospace Corporation

Static and Dynamic Testing of Space System Structures
Instructor: Paul A. Larkin, Maryland Sound Inc.

11:30 Lunch (on your own)

1:00 Afternoon Sessions (1 p.m. - 4:30 p.m. with a break at 2:35 p.m.)

Direct Field Acoustic Testing
Instructors: Paul A. Larkin and Matt Polk, Maryland Sound International

Detecting, Retaining, and Preventing Failures
Instructor: Barbara "Barb" Sande, Lockheed Martin Space Systems Company

Applied High Frequency Structural Dynamics, Shock, and Acoustics
Instructor: Richard Foss, Lockheed Martin Space Systems Company

4:30 Tutorials Conclude

6:00 Speakers Dinner (5:30 p.m. Reception on patio)

8:30 Presenters Meeting - Recap of Logistics

Tuesday, Oct. 16

7:00 Registration and Continental Breakfast

8:00 Kick-off
Dr. Jeffery Emdee, General Manager, Vehicle Systems Division, The Aerospace Corporation

Welcome and Opening Remarks
Dr. Wanda Austin, President and CEO, The Aerospace Corporation

Keynote Speaker
Mr. Douglas Loverro, Executive Director, Air Force Space and Missile Systems Center

8:30 Introduction/Logistics
Thinh Do, The Aerospace Corporation
Laura Fechete, Space Systems Loral

8:35 Break

TRACK A

8:55 Session I: Test Effectiveness and Standards

System Acoustic Acceptance Test Effectiveness Update
Alan Peterson, The Aerospace Corporation

The Value of Space Vehicle Acoustic Testing
Charles Wright, The Aerospace Corporation

Comparison of Unit Random Vibration Qualification Test Approaches
Enold Pierre-Louis and Brian McCarthy, The Aerospace Corporation

10:15 Break

10:30 Unintended Consequences of Changes and Their Impact on Test and Operations Success in the Space Industry
Barbara Sande, Lockheed Martin Space Systems Company

Affordable Mission Success
Vaun Grattet and Dave Shelton, Lockheed Martin Space Systems Company

Introduction of Test Standard Update and Activities on the Test Effectiveness Reflected by Ground Environmental Test Anomalies
Qinzhong Shi, Kenichi Yanagase, and Hideaki Uchikawa, Japan Aerospace Exploration Agency (JAXA)

TRACK B

8:55 Session II: Strategies and Methodologies

Payload Wing Deployment Assembly Test Program
Edward Boesiger, Lockheed Martin Space Systems Company

Data-Driven Application to Monitor Satellite Telemetry During Factory Testing
Christopher Tschan and Arthur Dhallin, The Aerospace Corporation; Christopher Bowman, Data Fusion and Neural Networks

Direct Field Acoustic Test (DFAT) Development and Flight Testing of Radiation Belt Storm Probe (RBSP) Satellites
Gordon Maahs, Johns Hopkins University Applied Physics Laboratory

10:15 Break

10:30 **Rigorous Test Planning Techniques for Unmanned and Autonomous Space Systems: A Look at Design of Experiments and Approximate Dynamic Programming**
Ricardo Valerdi and Ricardo Sanfelice, University of Arizona

Understanding Your Hardware through Constant Monitoring
Robert Krauth and Eduardo Garcia, Raytheon

Some Questions Regarding Aspects of Acoustic Testing and Test Facilities
Arloe Wesley Mayne III, Data Physics Corporation

11:45 Lunch

12:45 Otto Hamberg Best Paper Award – 26th ATS Winners:

Analytical Modeling of the Acoustic Field During a Direct Field Acoustic Test
Jerry Rouse, Mikhail Mesh, and Eric Stasiunas, Sandia National Laboratories

Spatial Variability Caused by Acoustic Wave Interference in Single-Drive Direct Field Acoustic Testing
Mike Van Dyke and Portia Jackson, The Aerospace Corporation

12:55 Keynote Introduction
Dave Shelton, Lockheed Martin Space Systems Company

Keynote Speaker
John Kowalchik**,** Vice President of Mission Success, Lockheed Martin Space Systems Company

1:20 Technical Chair Announcements
Thinh Do, The Aerospace Corporation
Laura Fechete, Space Systems Loral

1:25 Break

TRACK A

1:45 Session I: Test Effectiveness and Standards (cont'd)

Evolution of Complexity Index Framework to Include Comparison of Test Programs Completeness
Mauro Pasquinelli, Piero Messidoro, Valter Basso and Rosario Scozzi, Thales Alenia Space Italia SpA; Paolo Maggiore and Lorenzo Pace, Politecnico di Torino

Improvements in the Testing Standard (E-ST-10-03)
Pietro Giordano, Thales Alenia Space Italia SpA

Findings and Lessons Learned from Operational Anomaly Trending and Analysis
Stacey Graham and Arthur Dhallin, The Aerospace Corporation

Update on Implementing the "Test Like You Fly" Process into Government Space Programs
Julia White, Lindsay Tilney, Frank Knight, William Bjordahl, Charles Wright, and Terry Andy, The Aerospace Corporation; Capt. Aurelio Irizarry, U.S. Air Force

Highly Accelerated Life Test (HALT) Program at Space Systems Loral
Brian Kosinski and Dennis Cronin, Space Systems Loral

3:55 Break

TRACK B

1:45 Session II: Strategies and Methodologies (cont'd)

Status of Direct Field Acoustic Testing
Paul Larkin and Dann Hayes, Maryland Sound Inc.

Experiences in Performing a High-Intensity, Direct-Field Acoustic Test on a Contamination Sensitive System
Eric Stasiunas, Vit Babuska, David Gurule, Troy Skousen, Jerry Rouse, Sandia National Laboratories

Impact of Acoustic Standing Waves on Structural Responses: Reverberant Acoustic Testing (RAT) vs. Direct-Field Acoustic Testing (DFAT)
Ali Kolaini, Benjamin Doty, and Zensheu Chang, Jet Propulsion Laboratory

Magnetic Testing and Modeling, Simulation, and Analysis for Space Applications
Mary Boghosian, The Aerospace Corporation; Pablo Narvaez, Jet Propulsion Laboratory; and Ray Herman, formerly at The Aerospace Corporation

MSI Instrument (ESA Sentinel-2): From the Diffuser Characterization to the Structure and Instrument Tests at CSL
Isabelle Domken, Jean-Yves Plesseria, Emmanuel Mazy, Laurence Rossi, Sara Marcotte, S.Liebecq, I.Tychon, E.Renotte, C.Grodent, M.Thomé, A.Cucchiaro, Centre Spatial de Liège (Université de Liège)

3:55 Break

4:10 Simultaneous Multiaxis Mechanical Vibration Testing
Wayne Tustin, Equipment Reliability Institute

Nondestructive Evaluation Techniques to Ensure Mission Success
Oscar Esquivel, James Nokes, and Yong Kim, The Aerospace Corporation

A Generalized Duration Forecasting Model of Test-and-Fix Cycles
Dan Houston, The Aerospace Corporation

Tackling Program Cost, Schedule, and Risk Using Statistical Test Optimization*
Kedar Phadke, Phadke Associates Inc.; Dr. Neal Mackertich and Dr. Peter Kraus, Raytheon Integrated Defense Systems

5:50 Day 1 Adjourn

*not included in the proceedings

Wednesday, Oct. 17

7:00 Registration and Continental Breakfast

8:00 Welcome/Opening Remarks
Erwin Perl, The Aerospace Corporation
Dave Shelton, Lockheed Martin Space Systems Company

Keynote Introduction
John Forgrave, Jet Propulsion Laboratory

8:10 Keynote Speaker
Gen. Eugene L. Tattini (USAF, Ret.) Deputy Director, NASA, Jet Propulsion Laboratory

8:30 Tech Chair Announcement
Thinh Do, The Aerospace Corporation
Laura Fechete, Space Systems/Loral

8:35 Break

TRACK A

8:55 Session III: Instrumentation, Data Acquisition, and Evaluation

Nonintrusive Shock Measurements Using Laser Doppler Vibrometers
Shannon Statham and Ali Kolaini, Jet Propulsion Laboratory

Low Outgassing Accelerometers and Cables for Thermal Vacuum and Vibration Test Environments
Bob Metz, PCB Piezotronics

Identification of Sinusoids in the Presence of Random Noise
Alfred Mason and Dean Rattazzi, Northrop Grumman Corporation

Common Data Acquisition Systems (DAS) Software Development for Rocket Propulsion Test (RPT) Test Facilities – A General Overview
Phillip Hebert, Mark Hughes, Dawn Davis, Mark Turowski, Wendy Holladay, NASA/John C. Stennis Space Center; Peggi Marshall and Michael Duncan, ASRC Research & Technology Solutions LLC; Jon Morris and Richard Franzl, Lockheed Martin

10:40 Break

10:55 Brüel & Kjaer's Satellite Qualification Testing System

Patrick Wethly, Harry Zaveri, Brüel & Kjaer Sound and Vibration Measurement A/S

Infrared Emissivity Test Bench
Ginaluca Casarosa, AOES BV; Matteo Appolloni, ESA/ESTEC

Infrared Imaging Inside a Thermal Vacuum Chamber for Temperature Homogeneity Check on a Black Body Surface
Hyokjin Cho, Hee-Jun Seo, Sang-Hoon Lee, and Guee-Won Moon, Korea Aerospace Research Institute

TRACK B

8:55 Session IV: Innovations in Test Facilities & Equipment

Structural Dynamic Assessment of the GN2 Piping System for NASA's New and Powerful Reverberant Acoustic Testing Facility
Mark McNelis, Lucas Staab, Dr. James Akers, William Hughes, Li C. Chang, Aron Hozman and Michael Henry, NASA Glenn Research Center

Enhancements to Present Day Vibration Controllers
John Peard, Lockheed Martin Space Systems Company

Multishaker Seismic Base Installation and Validation Process
Vincenzo Di Pietro, Stefano Oliverio, Daniele Tiani, Thales Alenia Space SpA; M. Belotti and Matteo Rinaldi, Belotti Sistemi sas

Calibration of Structural Health Monitoring Sensors Aboard Military Fleet Aircraft
Joshua Davis, Curtis Rands, and Kevin Napolitano, ATA Engineering; Timothy Fallon, NAVAIR

10:40 Break

10:55 Vertical Large Field Cold Target Assembly for Microwave Imaging
Brian Maguire, Ball Aerospace & Technologies Corporation

Thermal Vacuum Testing of Passively Cooled Microwave Devices
John Williams, Michael Tockstein, Preston Partridge, and Timothy Wright, The Aerospace Corporation

A New Approach to Improve the Uniformity of Solar Simulator
Kenta Maruyama, Hiroki Akagi, and Tomoya Niwa, Japan Aerospace Exploration Agency (JAXA)

12:10 Lunch

1:10 Keynote Introduction
John Welch, The Aerospace Corporation

1:15 Keynote Speaker
Gwynne Shotwell, President, Space Exploration Technologies

1:35 Tech Chair Announcements
Thinh Do, The Aerospace Corporation
Laura Fechete, Space Systems/Loral

1:40 Break

TRACK A

2:00 Session III: Instrumentation, Data Acquisition, and Evaluation (cont'd)

Commercial-Off-The-Shelf FPGA Technologies as an Agile Test Mechanism
Eric Corson, Ryan Nguyen and Bruce Connors, Lockheed Martin Space Systems Company

Evolution of a Combined Data Acquisition and Control System for Space Simulation Facilities
Elie Choueiry, Canadian Space Agency

3:20 Break

TRACK A

3:35 Session V: Testing Challenges for Space Exploration

The Assembly, Integration, and Test Approach of the Intermediate eXperimental Vehicle (IXV) and European eXPErimental Reentry Test-bed (EXPERT), Synergies and Lesson Learnt
Vittorio Ancona and Giuseppe Giulianelli, Thales Alenia Space SpA

Challenges of Effective and Affordable Testing CCDev Ascent Abort Wind Tunnel Test
Olman Carvajal, Jose Custodio and James Johnson, The Boeing Company

Subscale Launch Acoustic Testing
Gary Ogg, National Technical Systems

EUCLID/PLATO Optimized Verification and Test Approach for Next Generation Scientific Satellites

Silvia Procchio and Vittorio Anocona, Thales Alenia Space SpA

From ISS to Space Exploration: Verification and Test Lessons Learned Using Also MAT€D
Piero Messidoro, Claudio Ferro, and Valter Basso, Thales Alenia Space SpA

TRACK B

2:00 Session IV: Innovations in Test Facilities and Equipment (cont'd)

Solar Simulation for the CREST Preflight Thermal-Vacuum Test at B-2
Robert A. Ziemke, NASA Glenn Research Center

Development of High Performance Closed Loop Nitrogen Thermal Conditioning Units for Space Applications
Christophe Grodent, Benoit Marquet, Pierre Jamotton, Antonio Cucchiaro, Centre Spatial de Liège, Université de Liège; Christophe Delrez and Philippe Preumont, AMOS

Inspection of the Window Lens of the Thermal Vacuum Chamber
Makiko Ando and Daisuke Takahashi, Japan Aerospace Exploration Agency (JAXA)

3:20 Break

3:35 Session IV: Innovations in Test Facilities and Equipment (cont'd)

Novel Test Methods for Spacecraft Flexible Coaxial Cables
Robert Ferro, The Aerospace Corporation

Delivering Cost-Effective Tester Programs Using Modularity and Graphical System Design
Carl Heide, National Instruments Corporation

Visualization System for ESTEC Large Space Simulator
Matteo Appolloni, Alessandro Cozzani and Gaetan Piret, European Space Agency; Gianluca Casarosa, AOES B.V

Photogrammetry for Accurate and Cost Effective Three Dimensional Center of Gravity Measurements
Thaddeus Kucharski and Kevin Sewell, Northrop Grumman Corporation

Research on the Multi Objective Optimization Method of High Performance Spacecraft Magnetic Facility

Liyi Li, Zhiyin Sun, Binhao Jiang, Hongchen Liu, Harbin Institute of Technology

4:55 Day 2 Adjourn

6:30 Interactive Technical Interchange
Posters and Vendor Displays

Thursday, Oct. 18

7:00 Registration and Continental Breakfast

8:00 Welcome/Opening Remarks
Erwin Perl, The Aerospace Corporation
Dave Shelton, Lockheed Martin Space Systems Company

Keynote Introduction
John Prebola, Aerospace Testing Alliance

8:10 Keynote Address
Lance Baxter, AEDC Deputy Chief Space and Missile Test Complex

Keynote Introduction
Erwin Perl, The Aerospace Corporation

8:35 Keynote Address
David Davis, Chief, Systems Engineering Division
USAF Space and Missile Systems Center

8:55 Tech Chair Announcements
Thinh Do, The Aerospace Corporation
Laura Fechete, Space Systems Loral

9:00 Break

TRACK A

9:10 Session VII: Test and People Management

Level Loading for Testing Laboratories
David Harrison, Lockheed Martin Space Systems Company

Enhancements to the Role of the RAT in Day of Launch Readiness

Lou Maack, Adrian Cuadra, Lockheed Martin Space Systems Company; Anh Cecil and Dr. Richard Chiu, The Aerospace Corporation; Cassandra Putnam, Integrity Applications Incorporated

Affordability in the Aerospace Industry, a New Way of Life
John Stalder and Jeff Quinn, Lockheed Martin Space Systems Company

10:30 Break

10:45 Session VII: Test and People Management (cont'd)

Breaking Down Barriers
Captain Alexander Ortiona, USAF Space and Missile Systems Center, MILSATCOM

Effective Test Management Through Managing People
Darin McNeal, The Aerospace Corporation

Bringing Situation Awareness to the Test Floor
Daniel Dimmock, Lockheed Martin Space Systems Company

It's All About the Test: Redressing the Balance Between Testing and Planning*
Peter Phillips and Robert Oertly, The Aerospace Corporation; Cameron Jerry, NASA GSFC

TRACK B

9:10 Session VI: Modeling, Analysis, and Simulation

A New Approach in Force-Limited Vibration Testing of Flight Hardware
Ali Kolaini and Dennis Kern, Jet Propulsion Laboratory

Test-Based Effective Mass Derived from an Efficient Methodology
Yvan Saucy, Vincent Caux-Brisbois, Canadian Space Agency

Determining Damping Trends from a Range of Cable Harness Assemblies on a Launch Vehicle Panel from Test Measurements
Andrew Smith, Dr. R. Ben Davis, NASA; Bruce LaVerde, ERC Inc.; Clay Fulcher, Douglas Jones, Jacobs Engineering

10:30 Break

10:45 Session VI: Modeling, Analysis, and Simulation (cont'd)

Modeling Variability of Transient Events in the Time-Frequency Domain

Greg Lobser, United Launch Alliance

*not included in the proceedings

Transient Propagation in Euler Beams
Don Huntington, United Launch Alliance

Using Round Robin Testing to Characterize Shock Test Methods
John Niehues, United Launch Alliance

Using Time-Frequency Analysis to Characterize Shock
John Hacker, United Launch Alliance

12:30 Lunch

TRACK B

1:30 Session VI: Modeling, Analysis and Simulation (cont'd)

Validation of Slosh Model Parameters and Anti-Slosh Baffle Designs of Propellant Tanks by Using Lateral Slosh Testing
Jose Perez, Russel Parks, and Daniel Lazor, NASA Marshall Space Flight Center

Verification of Acoustic Sound Characteristic by the Flight Acoustic Measurements Data
Tomoya Niwa, Qinzhong Shi, Japan Aerospace Exploration Agency (JAXA)

Acoustic Test and Analysis of Single Panel Simulator
Zhonghe Bo, KC Jiang, Stephen Wu, Space Systems Loral

Verification of Ares I Liftoff Acoustic Environments via the Ares I Scale Model Acoustic Test
Douglas Counter and Janice Houston, NASA Marshall Space Flight Center

3:20 Day 3 Adjourn