

WELCOME

The organizers cordially welcome all ILA members, government and agency representatives, user groups, manufacturers of satellite/Loran navigation and timing equipment, and all interested observers.

OBJECTIVE

The Key Question: *Is this the beginning of the beginning for 21st Century Loran, or the beginning of the end?*

This is in reality two questions—what is the role for Loran, and what actions are needed to enable Loran to fulfill its role—in the Post-9/11 World? From the U.S. Department of Transportation's report, "Vulnerability Assessment of the Transportation Infrastructure Relying on the Global Positioning System," it is clear that Loran can mitigate vulnerabilities in transportation, communications, timing, and other infrastructures.

MEETING INFORMATION

Registration and Fees. If you have not yet paid your fees for attendance at the meeting, please check in at the registration desk in the Arlington Ballroom Foyer.

Hospitality Suite. The Mount Vernon Boardroom will be available daily (08:00 - 24:00) for our attendees. During the evening, this room will be an informal meeting area for everyone attending the Conference.

Miscellaneous Information. The running of the 27th Marine Corps Marathon may impact your local travel. Please plan accordingly. Please help keep the program on schedule by promptly returning from breaks and lunches. Out of courtesy for our speakers, please keep group conversations outside the presentation rooms. On Sunday, October 27th, Daylight Saving Time begins - don't forget to "fall back" at 02:00.

Speakers' Breakfast. On the days that speakers are scheduled to give presentations, there will be a Speakers' Breakfast for speakers and chairpersons in the Monticello Room.

ILA Membership. Find out more about the ILA organization and join as a member. Membership information or renewal of your existing membership is available during the convention, at the Registration desk. Check out the ILA website (www.loran.org) for updated Loran news.

Meeting Proceedings for ILA 31 will be available on CD only. Cost for the Proceedings are included with the full registration fee or can be purchased separately. More information is available at the Registration desk or by contacting the ILA Operations Center.

ILA 31 Sponsors. The ILA gratefully acknowledges several sponsors who contributed time or money towards the functions for this annual meeting. Please see the list of Sponsors on the facing page. The officers and directors extend special thanks to all Sponsors!

CONVENTION COMMITTEE - ILA 31

Chairman:	Jim Doherty	jdoherty@ida.org
Co-Chairman:	Chuck Schue	cschue@wrsystems.com
Technical Chairman:	Bill Roland	broland@knology.net
GAUSS Chairman:	Gerard Offermans	goffermans@reelektronika.nl

CONVENTION SPONSORS



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31ST ANNUAL CONVENTION & TECHNICAL SYMPOSIUM OF THE INTERNATIONAL LORAN ASSOCIATION (ILA)

**Determining Loran's Role
in Mitigating Vulnerabilities
in a Post-9/11 World**

October 27-30, 2002

Crowne Plaza
Washington National Airport
Arlington, Virginia

DAILY SCHEDULE

SUNDAY, OCTOBER 27

- 14:00 - 17:00 Early Registration for all Conference Events - *Arlington Ballroom Foyer*
- 10:00 - 14:00 GAUSS Meeting - *Monticello*
Moderator: Gérard Offermans, Reelektronika, b.v.
- 15:00 - 17:00 ILA Board of Directors Meeting - *Monticello*
President Pro-Tem: Professor David Last, University of Wales
- 18:30 - 20:30 Icebreaker for all registered guests- *Arlington Ballroom 1 and Foyer*
Informal attire. Cash bar and light refreshments.
- 19:00 - 20:00 Registration Desk Open for all Conference Events - *Arlington Ballroom Foyer*

MONDAY, OCTOBER 28

- 08:00 - 10:30 Registration Desk Open for all Conference Events - *Arlington Ballroom Foyer*
- 07:00 - 08:30 Speakers Breakfast - *Monticello*

08:30 *Session 1: Arlington Ballroom 2, 3, & Foyer*

Plenary Session: GPS Vulnerability
Session Chair: James Doherty, Institute for Defense Analysis

- 08:30 - 08:40 **1.1** GPS Vulnerability - ILA President's Comments
President Pro-Tem: Professor David Last, University of Wales
- 08:40 - 09:05 **1.2** GPS Vulnerability - Vulnerability Assessment Response
Mike Shaw, Director of Radionavigation & Positioning, U.S. DOT
- 09:05 - 09:30 **1.3** GPS Vulnerability - Aviation Backup Needs
Michael J. Harrison, Former Director, NAS Architecture and System Engineering (ASD-100), U.S. FAA
- 09:30 - 09:55 **1.4** GPS Vulnerability - Timing Backup Needs
Judah Levine, PhD, Physicist, Time and Frequency Division, NIST
- 09:55 - 10:10 AM Break (open from 09:40 to 10:25) - *Arlington Ballroom 1 & Foyer*

10:10 *Session 2: Arlington Ballroom 2, 3, & Foyer*

Status and Plans of Loran-C Service Providers
Session Chair: James Doherty, Institute for Defense Analysis

- 10:10 - 10:35 **2.1** GPS Vulnerability - Overview of Loran-C in the United States
Mitchell J. Narins, Systems Engineer, Navigation Integrated Product Team (AND-702), U.S. Federal Aviation Administration
- 10:35 - 11:00 **2.2** Status - Maritime Backup Issues
CAPT Charles Lancaster, U.S. Coast Guard (G-OPN)
CAPT Curt Dubay, U.S. Coast Guard NAVCEN
- 11:00 - 11:25 **2.3** Status - Can Loran-C be a Credible Backup to GNSS in Europe?
Nick Ward, PhD, Trinity House
- 11:25 - 11:50 **2.4** Status - NELS Status
Gunn-Marit Hernes, Northwest European Loran-C System
- 11:50 - 12:15 **2.5** Status - Chayka: Current Status/Prospects for Improvement
Sergey B. Pisarev, Vadim S. Zholnerov, Andrey I. Kabirov, Sergey P. Zarubin, Ivan K. Konarzhevsky; The Russian Institute of Radionavigation and Time

- 12:15 - 13:45 Lunch in the *Veranda - Three entrée lunch buffet for all registered guests*
Speaker: Earl Waesche, Legislative Director, National Boating Federation
Emcee: James Doherty

13:45 *Session 3: Arlington Ballroom 2, 3, & Foyer*

Timing
Session Chair: Bill Roland, PVT Associates

- 13:45 - 14:10 **3.1** Timing - Time for Loran
Demeftrios Matsakis, PhD, Harold Chadsey; U.S. Naval Observatory
- 14:10 - 14:35 **3.2** Timing - The New Heartbeat of Loran
Tom Celano, General Manager, Timing Solutions Corporation,
LT Kevin Carroll, USCG Loran Support Unit
- 14:35 - 15:00 **3.3** Timing - The New Loran-C Time Scale and Possibilities for Future Enhancements
Samuel R. Stein, PhD, Timing Solutions Corporation
- 15:00 - 15:25 **3.4** Timing - A New Satellite Time Service
Al Gifford, National Institute of Standards and Technology
James Doherty, Institute for Defense Analysis
Tom Bartholomew, Northrup Grumman TASC

DAILY SCHEDULE

- 15:25 - 15:40 PM Break (open from 15:10 to 15:55) - *Arlington Ballroom 1 & Foyer*

15:40 *Session 4: Arlington Ballroom 2, 3, & Foyer*

New Techniques and Equipment
Session Chair: Robert Wenzel, Booz Allen Hamilton

- 15:40 - 16:05 **4.1** Timing - New Approach to Loran-C TOC Synchronization
Haitao WU, Yuling WANG, Yu HUA, Weihua HU; Chinese Academy of Sciences
- 16:05 - 16:30 **4.2** Timing - Fast TOC-less UTC Service Through Loran-C/Eurofix
Durk van Willigen, PhD, Arthur Helwig; Reelektronika, b.v.
- 16:30 - 16:55 **4.3** Timing - Loran as an Independent Source of UTC in Telecommunications Applications
William J. Walsh, Principal Staff Engineer, Motorola Network Solutions Sector
- 16:55 - 17:20 **4.4** Communications - New Loran-C Receiver Performance Levels for Extended Range Eurofix and Kinematic Applications
Gerard Offermans, Arthur Helwig, Rene Kellenbach, Woultter Pelgrum, Durk van Willigen, PhD; Reelektronika, b.v.
- 17:20 - 17:45 **4.5** Service Improvement - Loran-C Maintenance Support
Charles B. Stevens, PhD, PE, Raytheon Technical Services Company
CDR (sel) Alan Arsenault, USCG MLC LANT

- 18:30 - 21:00 Reception in the *Veranda - Hors D'Oeuvres and Beverages for all registered guests*

TUESDAY, OCTOBER 29

- 08:00 - 10:30 Registration Open for all Conference Events - *Arlington Ballroom Foyer*
- 07:00 - 08:30 Speakers Breakfast - *Monticello*

8:30 *Session 5: Arlington Ballroom 2, 3, & Foyer*

Service Improvement
Session Chair: CAPT Curt Dubay, USCG NAVCEN

- 08:30 - 08:55 **5.1** Service Improvement - The Loran Integrity Performance Panel
Ben Peterson, PhD, Peterson Integrated Geopositioning,
Per Enge, PhD, Sherman Lo, PhD, Lee Boyer; Stanford University
LT Kevin Carroll, USCG Loran Support Unit
Mitch Narins, Kevin Bridges; U.S. FAA
Robert Wenzel, G. Thomas Gunther; Booz Allen Hamilton
- 08:55 - 09:20 **5.2** Service Improvement - Making a Silk Purse from a Sow's Ear, Loran Style
David H. Gray, Canadian Hydrographic Service
- 09:20 - 09:45 **5.3** Service Improvement - Development of a Next Generation Transmitter Control System
Terry Yetsko, George Mukai; BCO, Inc.,
Erik Johannessen, Megapulse, Inc.
- 09:45 - 10:10 **5.4** Service Improvement - Modernization in the FERNS - N'ijjima Transmitter Control Upgrade
Michael Weisenbloom, John Allen, Andrei Grebnev, Felix Sebastian; Megapulse, Inc.

- 10:10-10:25 AM Break (open from 9:55 to 10:40) - *Arlington Ballroom 1 & Foyer*

10:25 *Session 6: Arlington Ballroom 2, 3, & Foyer*

Service Improvement
Session Chair: Doug Taggart, Overlook Systems Technologies, Inc.

- 10:25 - 10:50 **6.1** Service Improvement - Design and Test of the First Article Accufix 7500 Transmitter
Mark Danielli, Andrei Grebnev, Paul Johannessen, PhD,
Felix Sebastian; Megapulse, Inc.
- 10:50 - 11:15 **6.2** Service Improvement - Riding Down the Dusty Trail with the Four Horsemen
CDR Gordon K. Weeks, Jr., LCDR James Boyer; USCG LSU
- 11:15 - 11:40 **6.3** Service Improvement - Command and Control of the Loran Signal
LT Jim Betz, Ray Agostini; USCG LSU
- 11:40 - 12:05 **6.4** Service Improvement - Loran-C in Paradise
John B. Moore, W R Systems, Ltd.

12:05 - 19:00

Free Afternoon - *Enjoy the Washington, DC Metro area!*

DAILY SCHEDULE



WEDNESDAY, OCTOBER 30

- 08:00 - 10:30 Registration Open for all Conference Events - *Arlington Ballroom Foyer*
- 07:00 - 08:30 Speakers Breakfast - *Monticello*

8:30 *Session 7: Arlington Ballroom 2, 3, & Foyer*

Trials and Tests
Session Chair: Nick Ward, PhD, Trinity House

- 08:30 - 08:55 **7.1** Trials and Tests - Status of GPS/Loran Prototype for FAA Trials
Parick J. Hwang, PhD, Rockwell Collins
Linn Roth, PhD, Locus, Inc.
Mitchell J. Narins, U.S. FAA
- 08:55 - 09:20 **7.2** Trials and Tests - Flight Trials of All-In-View Loran Receiver and H-Field Antenna System
Linn Roth, PhD, Jim Schlein; Locus, Inc.
Dave Diggle, PhD, Ohio University
Mitchell J. Narins, U.S. FAA
- 09:20 - 09:45 **7.3** Trials and Tests - Loran-C User Position Software Navigation Performance with the August 2001 Cross-Country Flight Test Data
Jaime Y. Cruz, PhD, Robert Stoekly, PhD; Ilgen Simulation Technologies, Inc.
- 09:45 - 10:10 **7.4** Trials and Tests - Preliminary Results of Differential Loran Studies with All-In-View Receiver
Paul Schick, Linn Roth, PhD, Jim Schlein; Locus, Inc.

- 10:10 - 10:25 AM Break (open from 9:55 to 10:40) - *Arlington Ballroom 1 & Foyer*

10:25 *Session 8: Arlington Ballroom 2, 3, & Foyer*

Propagation & Calibration
Session Chair: Robert Lilley, PhD, ISTI

- 10:25 - 10:50 **8.1** Propagation & Signal Processing - New Ways of Looking at Loran-C ASF's
Professor David Last, Paul Williams, PhD; University of Wales
- 10:50 - 11:15 **8.2** Propagation & Signal Processing - A Preliminary Study of Loran-C Additional Secondary Factor (ASF) Variations
CAPT Richard Hartnett, PhD, USCG Academy
Gregory Johnson, JMA, Inc.
Peter Swaszak, PhD, University of Rhode Island
Mitchell J. Narins, U.S. FAA
- 11:15 - 11:40 **8.3** Propagation & Signal Processing - Full Performance Analysis of IFFT Spectral-Division Technique for Skywave Identification in Loran-C Receivers
Abbas Mohammed, PhD, Blekinge Institute of Technology
Professor David Last, University of Wales
- 11:40 - 11:55 **8.4** Propagation & Signal Processing - The Status of Solar Cycle 23
Joe Kunches, Space Environment Center, NOAA

- 11:55 - 13:15 Lunch in the *Veranda - Three entrée lunch buffet for all registered guests*

- 13:30 - 14:00 General Membership Meeting - *Arlington Ballroom 2, 3, & Foyer*
President Elect: Linn Roth, PhD
- 14:10 - 15:00 Conference Resolution & Discussion - *Arlington Ballroom 2, 3, & Foyer*
Moderators: Robert Lilley, PhD, Ilgen Simulation Technologies, Inc.
Linn Roth, PhD, Locus, Inc.
- 15:30 - 16:30 ILA Board of Directors Meeting - *Monticello*
President Elect: Linn Roth, PhD

THURSDAY, OCTOBER 31

- 09:00 - 14:00 GAUSS Meeting - *Monticello*
Moderator: Gérard Offermans, almost PhD