



# Loran Lines

September 2006

Newsletter of the International Loran Association

Volume 2006-2

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## Congressional Committee supports continued funding of eLoran

The Senate Appropriations Committee denied a request to terminate operation of Loran stations nationwide as contained in the proposed Coast Guard Budget, and directed the Secretary of Homeland Security to refrain from taking any steps to reduce operations at such stations.

The unilateral action taken in February 2006 by USCG in deleting all Loran support from its FY 2007 budget was unexpected, since in October 2005 at ILA 34 it was declared that this matter would be decided in 2006 by a cabinet-level group of departments.

The committee further directed the Secretary of Homeland Security to submit a report to the Appropriations Committee and to the Commerce Committee regarding the future of Loran. It was specified that the report include an analysis of the cost benefits of Loran, the merits of maintaining the system as a back-up navigational aid and the benefits of using the system in conjunction with GPS.

## AOPA urges Loran as backup to GPS

The Aircraft Owners and Pilots Association (AOPA) has been a long-time advocate of the continued operation of Loran as an RNAV system. Loran has a long history of reliable operation providing significant value to General Aviation pilots and operators. This support continues to be evident in the letter which Phil Boyer, President of AOPA, recently sent to FAA Administrator Marion Blakey pointing out the need to continue Loran as a backup to GPS. He cited the facts that the Loran infrastructure has been significantly modernized with similar performance characteristics and that the eLoran now in place provides a very viable positioning and timing signal for aviation at no cost to the FAA or DOT.

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## Future Air Traffic Control plans will require eLoran for signal backup

The Joint Planning and Development Office (JPDO) is assuming the task of putting into place the Next Generation Air Transportation System (NGATS). FY 2007 will see an effort to put the Automatic Dependent Surveillance - Broadcast (ADS-B) initiatives on a fast track. Using the ADS-B system, aircraft will constantly broadcast their current navigation information. ADS-B depends critically on data from GPS or other navigation systems and hence will require eLORAN signal backup as protection from signal outages.

Created by Vision 100 FAA reauthorization bill the JPDO is managed jointly by the FAA and NASA and supported by the Departments of Commerce, Defense, Homeland Security, Transportation and the White House Office of Science Technology.

On August 2, 2006, FAA Administrator Marion Blakey announced that Charles Leader will be the new Director of JPDO.

ADS-B will report, over a dedicated 1090-MHz radio link, the following data:

- aircraft position
- altitude
- identification
- category
- airspeed
- whether the aircraft is turning, climbing or descending

Other aircraft and ground-based stations can receive this information and use it in a wide variety applications.

*(Continued on page 3)*

★ **ILA35 Convention and Technical Symposium** ★

October 22 – 25, 2006, in Groton, Connecticut

Be there!

# International Loran Association

## Board of Directors and Committee Chairs – 2006

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\* filling one-year Bond vacancy

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A complete listing of the Board Membership, addresses and phone/fax numbers can be found on the ILA website: [www.loran.org](http://www.loran.org)

ILA members who have not yet paid this year's dues are asked to do so now. Membership forms can be downloaded from ILA's website:

<http://www.loran.org/Membership/Formindividual.htm>

Please note ILA's web site address: <http://www.loran.org>  
and e-mail address: [ila@loran.org](mailto:ila@loran.org)

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The ILA encourages readers to submit material for publication. Any and all news related to Loran and ILA members is welcome. Send information (with pictures, if possible) to either of the co-editors:

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Boyer characterized the recent proposal by the US Coast Guard to terminate Loran operations as a shortsighted measure that would waste substantial FAA and taxpayer investments. He pointed out that this action is also contrary to agreements between Secretary Mineta of the Department of Transportation, Secretary Chertoff of the Department of Homeland Security and others to arrive at a joint decision regard in Loran in 2006.

With the recent decisions announced by the Joint Planning and Development Office (JPDO) to deploy the Automatic Dependent Surveillance - Broadcast system (ADS-B) as one of the initial stages in the creation of the Next Generation Air Transportation System (NGATS) the requirement for a backup positioning resource becomes even more critical. Loran should be kept available for this role and should not be summarily decommissioned.

ADS has been considered to be an augmentation or replacement of current methods of monitoring aeronautical traffic. It costs less than conventional radar and provides higher quality surveillance.

It is effective in remote or mountainous areas and can also enhance surveillance of the airport surface and monitor runway and taxiway traffic.

## **ILA letter to Secretary Chertoff of DHS outlines the growing vulnerability of satellite-based radio navigation signals and the need for eLORAN as a second source**

In a letter providing a comprehensive review of the intrinsic vulnerability of GPS and the effective performance demonstrated by present day modernized Loran (eLORAN), ILA President Langhorne Bond urged Secretary Chertoff to join with DOT Secretary Mineta and Deputy Secretary Cino and endorse the continuation of LORAN for the foreseeable future.

Mr. Bond summarized the worldwide acceptance by numerous marine agencies of Loran as an essential resource in the event of the loss or interruption of GPS, and expressed a deep concern that DHS has failed to recognize that serious problems with GPS reliability exist and need to be attended to.

A report to DHS by the Homeland Security Institute on the vulnerability of the US telecommunications systems in the event of a loss of GPS timing and other reports on the impact of such loss on GPS

users have not been made public. As a consequence, ILA and others have not been able to review these reports and make appropriate comments on the belief held in many quarters that these studies are flawed and superficial.

He expressed a concern that the US Coast Guard has not conferred with the maritime community, ship owners, boaters, masters, pilots, port captains or shippers on the vulnerability of GPS, in order to explore the problem of safe operation of modern ships with large passenger capacity or hazardous cargoes. Such a discussion of the problem would also include the simple solution provided by Loran as on-line backup.

He pointed out that in what was termed an exhaustive plan for the protection of the national infrastructure, DHS made no mention of the impact of a terrorist attack on GPS on transportation safety or time-dependent industries. Jammers have been available for many years, with commercial off-the-shelf devices shown at recent air shows. The ease with which GPS can be jammed and the grave consequences on basic elements of the national infrastructure should make this topic one of significant concern at all levels.

With the presentation of the Volpe Report at the CGSIG meeting in Salt Lake City on September 10, 2001 and the grim confirmation of the skill and enterprise of the determined terrorist the next day, a demanding set of performance tests were initiated by Secretary Mineta to determine the suitability of modernized LORAN for Position, Navigation and Timing. The tests have been completed and LORAN passed every one. It would appear that the report on the cost/benefit study of LORAN remains blocked from release by the Coast Guard, thereby preventing the release to the public and the subsequent Executive Branch decision on the future role of LORAN.

In conclusion Bond points out that significant cost reduction steps can and should be taken in many areas of Loran operations: reversion to remote control, relocation of transmitters to more cost-effective sites, and the contracting out of routine Loran operation and maintenance.

*Note: The complete letter from Mr Bond to the Secretary can be downloaded from the ILA website: [www.loran.org](http://www.loran.org)*

# Meetings

## ILA-35 2006 Convention and Symposium meets in Groton CT October 22 – 25

Under the direction of Conference Chair Dr. Gregory Johnson of Alion Science and Technology and Technical Chair Dr. Peter Swaszek of the University Of Rhode Island, plans for ILA 35 to held at the Mystic-Marriott Hotel and Spa, Groton CT are rapidly moving forward.

Highlighting the mission of the members and friends of ILA, this session is dubbed "2006: The Year of Loran." A comprehensive presentation of the future role of eLoran in preserving the security and continuity of navigation and timing systems is being planned

### Preliminary Schedule:

Sunday Oct 22	Early Arrival Social
Monday Oct 23	ILA Global Augmentation of Satellite Systems (GAUSS) Working Session ILA Board of Directors Meeting Icebreaker Reception at Hotel
Tuesday Oct 24	Morning: Technical Session Luncheon: Speaker Afternoon: Technical Session Reception aboard USCGC Eagle
Wednesday Oct 25	Morning: Technical Session Luncheon: Membership Session Afternoon: Technical Session ILA Board of Directors Meeting Reception, Banquet, Awards, Speaker

### MEMBERSHIP

NOW is the time to renew your membership! There is an on-line membership form at [www.loran.org](http://www.loran.org) for your convenience. Renew your own membership or encourage your corporate member to renew and include you!

PLEASE use this secure online method if at all possible to save time and cost for the ILA. Of course you may print the on-line form and fax or mail it back to the ILA Operations Center if you wish to use alternate forms of payment. Please remember that wire transfers require prior approval from the Operations Center and an additional fee.

# Meetings

Technical topics related to current national and international concerns may include:

- The Vulnerability of GNSS
- Continuity of Telcom systems with loss of GPS
- Critical Study of Marine Navigation challenges without operating radionav aids

In addition, the program will include reports on eLoran system status and continuing modernization, the use of Loran for time and frequency references, and other topics related to policy, management and the need for receiver certification.

Abstracts of papers are due September 15, 2006 and should be sent to [swaszek@ele.uri.edu](mailto:swaszek@ele.uri.edu) with a copy to [ila@loran.org](mailto:ila@loran.org).

Conference Registration: An online reservation form is available at <http://www.loran.org/events.html> which can be completed and submitted on-line or printed and sent by mail or fax to:

ILA Operations Center  
741 Cathedral Pointe Lane  
Santa Barbara, CA 93111  
Fax 805.967.8471

## Hotel Reservations

Call hotel reservation line at 866.449.7390  
Or reserve online at: <http://marriot.com/property/propertypage/GONMM>

US Gov't Per Diem rate \$ 87 code LAGLAGA  
Conference rate \$ 159 code ILAILAA

## In Memory of Walter Nelson Dean 1919–2006

Those who knew and worked with Walt are asked to submit thoughts, recollections and appreciations for the next issue of Loran Lines.

## Bond returned to office as ILA President for second term

Results of the recent ILA election have provided the following board membership for 2006-2007:

	Term expires
President	
Langhorne Bond	2007
Past-President	
John Beukers	2007
William Brogden	2007

## Elected Directors

Marc Clarens	2007
David Diggle	2007 *
Thomas Gunther	2008
Tamotsu Ikeda	2007
Erik Johannessen	2008
Robert Lilley	2009
Sherman Lo	2008
Jacques Manchard	2009
Gerhard Offermans	2007
Douglas Taggart	2007
Paul Williams	2009
Durk van Willigen	2009

\* filling one year Bond vacancy

Plus three appointed directors to serve 1-year terms

## Bush nominates Mary Peters as Secretary of Transportation

The President on Tuesday Sept 5, 2006 put forward the name of Mary Peters, former chief of the Federal Highway Administration from 2001 to 2005, for DOT Secretary to fill the opening created by the resignation of Norman Mineta in July after serving for 5-1/2 years. Mineta was the longest-serving Transportation Secretary and spent much of his term in office coping with the impact of 9/11 on U.S. aviation, a period of financial crisis for the industry, and the need to introduce wide-spread security measures at transportation facilities throughout the country.

While in the Highway administration, Peters was active in preparing the government position on highway legislation and was an advocate for the exploration to new means for financing road projects. She favored expanding the authority of states to levy tolls on motorists and advocated greater private sector investment in highways. In speaking at the White House where her nomination was announced,

Peters said that she would work to modernize an aging system, declaring that "We are experiencing increasing congestion on out highways, railways, airports and seaports which robs our nation of productivity and our citizens of quality time with their families." Since November Peters has been director for national transportation policy matters and consulting in the Phoenix office of HDR Inc., an Omaha-based architectural, engineering and consulting firm.

She is a graduate of the University of Phoenix and attended the Harvard University School of Government.



Mary Peters

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## RTCM report asserts eLoran fully-qualified to provide a national timing backup system

The navigation community has paid substantial attention in the past few years to the demonstrated ability of eLoran to provide precision navigation and position support in the event of GPS signal outages. Loran system upgrades have also enhanced the capability to provide a high quality reference for time synchronization and frequency control.

The telecommunications industry has strict performance requirements related to system time synchronization and frequency control that must be met at all times to support the operational requirement of telephone services and wireless networks. The use of GPS satellites as their reference for these functions makes many systems dependent on full-time signal availability.

The paper entitled *The Role of Loran Timing in Telecommunications* presented by Michael Lombardi (NIST), Chuck Norman (Sprint Nextel) and William Walsh (Motorola) at the RTCM meeting in Long Beach, CA on May 1, 2006 evaluates the present capabilities of eLoran to provide a backup to timing services provided by GPS satellites. They find that that Loran, enhanced to eLoran, meets all the requirements for satisfactory service as a backup for time synchronization and frequency control, and meets the concomitant need for signal coverage, signal reliability and quality required by international time standards.

## General Light House Authorities identify eLoran as an essential component of future e-navigation based on GNSS

The General Light House Authorities of The United Kingdom and Ireland released on May 10, 2006 "The Case for eLoran," a report which examines in detail the capabilities of LORAN as it has evolved into the highly sophisticated system represented in today's eLoran. Citing the inevitable vulnerabilities of GNSS, the report demonstrates that eLoran has a unique and vital role in future plans to assure increased safety for maritime operations.

The e-Navigation concept has evolved under guidance of the IMO Committee on Maritime Safety. Its formulation has been driven by the increasing need to coordinate all aspects of marine traffic, vessel identification and control. Essential components of e-Navigation will include accurate and reliable electronic positioning signals, comprehensive navigation charts in electronic format, plus a system for transferring ship-to-shore, shore-to-ship and ship-to-ship of all positional and navigational information with provision for a clear integrated electronic display of data on ships in the vicinity.

e-navigation is designed to enhance harbor-to-harbor navigation and related services as essential need for safety and security at sea.

Every aspect of marine transportation – ship size, ship speed, and traffic density at significant ports and so-called choke-points like the English Channel – shows a steady increase. Government agencies and commercial interests urgently need a comprehensive monitoring and control capability that matches the present and future demands of the marine community.

In considering the move toward major dependence by shipping on GNSS sources, the report points out that there is still a need for physical aids to navigation (buoys and lights) as a backup in the event of losing GNSS capabilities. At the same time it is recognized that the infrequent use of such physical aids will depend on personnel who, in time, will have less of the traditional skills associated with their interpretation and use. For this reason the primary backup for GNSS services must possess similar operating characteristics to the modality it replaces.

Loran as a ground-based radio navigation system provides the same sort of system inputs as GNSS and can, in hybrid receivers, proved a seamless transition from one navigation data stream to another. While advising the operator of the transition the data messages, there will be no difference in the performance of downstream devices, alarms, display monitors or data storage. To become qualified to provide this caliber of service, the overall quality of the Loran system has been progressively upgraded with new, more reliable transmitters and timing components, and many aspects of system control have been improved. This has been achieved with outstanding success. eLoran now demonstrates a positioning capability comparable to that expected from single frequency GPS or Galileo.

The provision of a second independent system backup for the essential input of position data is consistent with best navigation practice. The report points out the similarity between all GNSS signals, (GPS, Galileo and GLONASS) and their dissimilarity to LORAN in terms of radio frequency and signal strength. These differences serve to assure that the two systems are not concurrently influenced by the same physical parameters of the

ionosphere or subject to equal vulnerability to signal contamination, whether accidental or deliberate.

While world attention has been focused on the possible disruption of essential services by terrorist groups to advance their political agenda, there are other motivations in the commercial and law enforcement sector for increasing the integrity of electronic navigation signals. One rapidly growing area is that of road use charges in which position-sensor-equipped vehicles report their entry into and progress along a monitored toll road system.

In some cases efforts to monitor vehicles such as taxis, snow plows etc., have caused serious contention. Such a reaction could easily lead to the illegal use of jamming or spoofing devices to thwart the objectives of tracking.

In a broader application emergency response vehicles are increasingly equipped with position sensors for location and efficient dispatch to points of need. In many cases, particularly in the urban environment, GNSS signals are reduced or unavailable while the lower frequency signals of Loran can still penetrate.

In stressing the value of eLoran as a backup for GNSS signals it is urged that the appropriate EU agencies investigate the provision of LORAN C signal availability on a European-wide basis, and further that member states work to harmonize LORAN standards and support the development of multi-modal receivers.

*The full text of this report "The Case for eLoran" prepared by the Research and Radio Navigation section of the General Light Authorities of the United Kingdom and Ireland is available as a pdf file on the ILA website [www.loran.org](http://www.loran.org)*

# Positioned for the future



Innovators in advanced navigation and communication concepts  
Leaders in high power, low frequency solid-state transmitter technology



## eLoran Monitor Receiver

The Accufix eLoran Monitor Receiver is designed for use in monitor and control of Loran systems. The unit is designed to support legacy Loran-C systems while featuring the processing capabilities for tomorrow's eLoran. Housed in a 2U 19" rack module, the powerful DSP platforms are flexibly controlled via software commands.

## eLoran Antenna

The eLoran sensor integrates GPS, Loran, and their augmentation systems such as WAAS in a single package. A clear benefit is the two independent navigation systems with dissimilar failure modes. A single cable provides power in and data out. In addition to precision navigation from the WAAS/GPS, the eLoran outputs true TD data. The crossed loop antenna also provides compass functionality with true heading accuracy within 1 degree, even while stationary.

## Loran Signal Generator

The LS1000A is a precision Loran Signal Generator that generates a simulated Loran-C signal. Pulse and group parameters that can be controlled include the Group Repetition Interval, ECD, and phase code. In response to a 5MHz input, the unit will output a single rate stream of Loran pulses on either or both of two rear panel connectors. Additionally, the output can be automatically synchronized and/or phase delayed to an external signal such as Phase Code Interval (PCI), Local Interval (LI), or Loran-C Time of Coincidence (TOC.)



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