



# Loran Lines

April 2009

Newsletter of the International Loran Association

Volume 2009-1

## Highlights:

### 2008 FRP released

– page 1

### eLoran's future threatened

– page 3

### ILA Press Release

– pages 4 & 5

### Support for eLoran

– pages 4-7

### RTCM meets in May

– page 6

### Contacting Congress

– page 7

## US Departments of Defense, Transportation and Homeland Security release 2008 Federal Navigation Plan

Published jointly by DOD, DOT and DHS, the plan describes US Federal policy for operating and regulating common-use radio navigation systems. The new document replaces the 2001 *Federal Radionavigation Systems*, a companion document to the FRP, and the 2005 FRP. The FRP is available on line at [http://www.navcen.uscg.gov/pubs/frp2008/2008\\_Federal\\_Radionavigation\\_Plan.pdf](http://www.navcen.uscg.gov/pubs/frp2008/2008_Federal_Radionavigation_Plan.pdf). The plan outlines the policy and plans for operating a wide range of federal radio navigation systems used for positioning, navigation and timing (PNT) applications and how existing systems may in the future be consolidated and improved. Of vital interest to members of the ILA and readers of *Loran Lines* is the inclusion of Loran-C and its successor system eLoran as a continuing component of the Federal Radionavigation Plan.

**Section 1.6.2.1** cites the 2001 Volpe report assessment of the vulnerability of the GPS satellite signals to interference with a subsequent loss or impairment of PNT data which makes it essential that a reliable backup system be put in place.

**Section 3.24** presents the need to plan for a backup to GPS. It further states:

“In March 2007 the DOT Pos/Nav Executive Committee and the DHS Geospatial/PNT Executive Committee accepted the findings of the Institute of Defense Analysis Independent Assessment Team and approved ... the designation of Enhanced-Loran, commonly referred to as eLoran as a National PNT backup for the U.S home-

*Continued on page 3*

## Administration budget proposals threaten future of eLoran

The announcement that the U.S. Coast Guard budget, as submitted by the new administration, might not provide funds for Loran and its transformation into eLoran has sent shock waves of surprise and concern throughout much of the navigation community. The news followed only by days the long-awaited issuance by the Department of Homeland Security (DHS), Department of Transportation (DOT), and Department of Defense (DOD) of the 2008 Federal Radionavigation Plan which clearly stated the need for a backup to provide essential Position Navigation and Timing (PNT) information in the event of the loss or a deterioration of GPS signals. The Plan identified an upgraded

*Continued on page 5*

## Press release issued by ILA on March 17, 2009

### A Future With eLoran

Radionavigation is a global business with a global footprint and the U.S. Global Positioning System (GPS) has been the jewel in the crown for nearly a generation. The U.S. has established such a level of trust in its operation of GPS that governments, service providers, and users worldwide have included it in their critical infrastructure, safety-critical, and mass-market applications, and have decommissioned many other aids to navigation. In making decisions on GPS and other systems, the international community takes careful note of the U.S. Federal Radionavigation Plan (FRP): “the official source of U.S. radionavigation policy and planning”

All radionavigation systems, including GPS, have their weaknesses. On February 7, 2008, the U.S. Department of Homeland Security (DHS) announced that it would be-

*Continued on page 3*



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A complete listing of the Board Membership, addresses, affiliations 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:

[www.loran.org/Membership/FormIndividual.htm](http://www.loran.org/Membership/FormIndividual.htm)

or

[www.loran.org/Membership/FormCorporate.htm](http://www.loran.org/Membership/FormCorporate.htm)

Please note ILA's web site address: [www.loran.org](http://www.loran.org)  
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*Loran Lines* is an official publication of the International Loran Association (ILA).

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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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## 2008 FRP Released

*Continued from page 1*

land. At its March 2007 meetings the National Space-based PNT ExComm supported this approach and tasked DOT and DHS to complete an action plan that includes identifying an executive agent, developing a transition plan to address the funding and operations and requesting approval by the DOT and DHS Secretaries.”

In March 2008 the National Space-based PNT ExComm endorsed the decision of The Department of Transportation and the Department of Homeland Security decision to transition the present Loran-C system to eLoran.

DOT has determined that while there are sufficient alternative navigation aids in the event of the loss of GPS-based service, eLoran would provide an essential backup service for those applications in the national infrastructure which require precise time and frequency.

**Section 5.1.4.1** describes the present structure and mission of Loran-C. In the words of the FRP “DHS continues to maintain and operate the Loran-C system in the short term while converting to eLoran, subject to the availability of funds as required by U.S. Law”

**Section 5.1.4.2** summarizes the characteristics of eLoran and its vital role in preserving the integrity of the PNT resources of the national infrastructure:

“eLoran is the next generation Loran system. Terrestrial-based eLoran is an independent, dissimilar complement to the GPS. It will allow properly equipped users to retain PNT service in the event of GPS disruption. It has better accuracy, integrity and continuity than Loran-C while continuing to meet Loran-C’s traditional availability requirements. eLoran can provide the precise time and frequency references needed by the telecommunications systems and other elements of critical infrastructure.

“This improvement is realized through station equipment upgrades, the addition of a data channel to the signal-in-space and all-in-view digital signal processing receivers. While eLoran is designed to be backward compatible with Loran-C, users would require a new receiver to take full advantage of eLoran capabilities.

“The combination of infrastructure and user equipment improvements will enable eLoran to meet the requirements for landing aircraft during a non-precision instrument approach as well as the requirements for marine harbor entrance and approach.”

The USCG Navigation Information Service (formerly the GPS Information Center) will gather and process and disseminate timely Loran, GPS and DGPS radionavigation information as well as general maritime navigation information to the user community as described in Section 5.2.1. ■

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## ILA Press Release

*Continued from page 1*

gin implementing Enhanced Loran (eLoran), an enhanced and modernized version of Loran-C, as the U.S. national backup system. This independent positioning, navigation, timing, and data delivery system would mitigate the safety, security, or economic effects of a loss of GPS for critical infrastructure applications, especially those that require precise time and frequency. The 2008 U.S. FRP, released by the new administration in February 2009, states that this decision was based on the findings of the U.S. Institute for Defense Analysis’ Independent Assessment Team and endorsed at the March 2008 meeting of the U.S. National Space-based PNT Executive Committee.

The international community and the International Loran Asso-

ciation (ILA) applauded the February 2008 U.S. decision. It was well timed to take advantage of European developments that had demonstrated the exceptional value-for-money and high performance of minimally-manned eLoran stations. The U.S. DHS announcement stimulated investment decisions and eLoran development activities worldwide.

In our rapidly changing and connected world, the ILA notes that the proposal by the U.S. Office of Management and Budget (OMB) to terminate Loran-C within a week of the publication of the 2008 FRP only makes sense when the termination of the Loran-C program is part of the transition to an eLoran program. Additionally, it should be recognized that a significant part of the existing modernized Loran-C

infrastructure can be used for an efficient transition to eLoran. If this is the intent of the OMB statement, then the ILA encourages this development and awaits a plan for its implementation.

As an international Association, the ILA believes that a U.S. decision in 2009 to transition to eLoran will have a positive effect worldwide, will build industrial capability, and will drive creativity and innovation. As numerous studies have shown, the greatest benefit option for Loran-C service providers is to transition to eLoran. The ILA stands ready to support governments, service providers, and users worldwide in that decision-making process. ■

## ILA Board seeks nominations from membership

Nominations from the ILA membership are solicited for ILA President and positions on the Board of Directors. Please submit your nomination to **bob@loran.org** as soon as possible, including a brief biography which will be distributed with the election ballots. You may nominate yourself or an other ILA member who has agreed to serve if elected.

A brief description of the Director position follows:

Members of the International Loran Association Board of Directors are elected by the membership to three year terms or appointed

by the President for 1 year terms. From the group of 15 Directors the President appoints the members of the Executive Committee, Vice-President, Treasurer and Secretary. The Immediate Past President also serves on the Executive Committee

The Constitution and Bylaws give broad powers to the Executive Committee to carry out ILA activities but the Board is consulted on matters of importance, changes to the Constitution and other issues. Board members are urged to participate in the ILA annual conference and serve on standing and special committees. Some committee functions are performed by the ILA Operations Center with Board oversight.

Standing Committees of the ILA include Audit, Awards, Constitution, Convention, Membership, Historical Journal, Loran Technology and Applications, Membership, Newsletter, and the Nominating and Elections Committee.

Special Committee: GAUSS (GNSS Augmentation Systems Standards).

The Board meets in person once a year at each Annual Convention and at other times as necessary by teleconference. Routine ILA business is handled using e-mail for communications and voting. ■

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## David Last joins ILA Board of Directors

By unanimous vote of a majority of the board, Dr David Last was appointed to fill a Board vacancy which expires with the ILA convention in 2011.

Dr. Last is a Professor Emeritus of the University of Wales, a Fellow and past president of the Royal Institute of Navigation, and a Fellow of the Institute of Electrical Engineers and a Chartered Engineer. He received the degree BSc (Eng) at Bristol England in 1961, the PhD from Sheffield in 1966 and the DSc from the University of Wales

in 1995. He is a past president of the ILA and holder of its Medal of Merit.

Dr Last has published many papers on navigation systems, including Loran-C, Decca Navigator, Argos, Omega, Marine Radiobeacons, GPS and DGPS. In Loran he has specialized in understanding signal propagation and employing that knowledge to predict system coverage and ASFs. He has also developed receiver techniques for measuring skywave delays. He acts as consultant on radio-navigation and communications to companies and to governmental and international organization He is an



Dr. David Last speaking at NAV08/ILA37

instrument-rated pilot and a user of terrestrial and satellite navigation systems. ■

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## Senate Homeland Security Committee member supports full deployment of eLoran

In a letter from Senator Susan Collins, Ranking Member of the Senate Homeland Security and Governmental Affairs Committee, to the Senate Budget Committee regarding the FY 10 budget resolution, it is pointed out that the proposed termination of Loran-C is

inconsistent with the 2008 Federal Radio Navigation Plan (FRP) as prepared jointly by Department of Homeland security (DHS), and the Departments of Defense (DOD) and Transportation (DOT). The FRP proposed the use of eLoran to provide Position, Navigation and Timing (PNT) as an essential back-up for GPS. Any action to terminate Loran is also at odds with the findings of a 2006 Independent Assessment

Team which unanimously recommended that e-Loran be maintained. Such a decision is contrary to past Congressional action which has over the last ten years made a substantial investment in maintaining and upgrading the Loran infrastructure. In conclusion, funding is urged for the full deployment of an eLoran system as a backup to GPS. ■

## Budget proposals

*continued from page 1*

Loran, eLoran, as the appropriate system. This requirement, to support and sustain the continuity of the national communication infrastructure through the implementation of eLoran, was previously announced in a statement by DHS on the adoption of a national backup system dated February 7, 2008. This backup system, the statement declared, will be enhanced Loran or eLoran, a land-base independent system which will mitigate any safety, security or economic effects of a GPS outage or disruption.

The response in opposition to the proposed budget action has been prompt, arising from many quarters in the government and the private sector. Already the Senate Commerce Committee and Senate Committee for Homeland Security and Governmental Affairs have lodged letters of protest regarding the proposed reduction in support funds. Essential portions of the text of these communications are reported elsewhere in this issue of Loran Lines along with the formal statement "A Future with eLoran" prepared by the Board of Directors of the ILA.

The long years of slow but steady growth in the modernization of Loran to achieve a status as eLoran with its potential to provide a reliable, robust and seamless backup to GPS has been documented and demonstrated by exhaustive trials and analysis. Most recently a Blue Ribbon Committee charged with the evaluation of eLoran declared that it was a cost effective and technically qualified back-up for GPS. Any proposed reduction in the support for Loran and the creation of eLoran as backup up for GPS should be opposed by all those concerned with the preservation of the complex national PNT infrastructure. ■

## Air Traffic Reform Foundation urges continued support of eLoran

Under the headline "DON'T DUMP LORAN," ATC Reform News declares that proposals by the Administration to omit funds for Loran from the FY 10 budget are a serious mistake in view of the fact that the recently published 2008 Federal Radionavigation Plan calls for the implementation of an enhanced version of Loran, eLoran, as the principle GPS systems back-up. With continuing Congressional support the U.S. Coast Guard has already created upgrades to 19 stations to eLoran level. In response to the future plans outlined in the FRP, the navigation-receiver industry is creating hybrid GPS/eLoran receivers that would continue to provide basic timing and frequency

references as well as navigation and landing information if GPS signals were disrupted. The decision to provide a GPS backup using eLoran has received substantial support from several segments in aviation user community and from The Alliance for Telecommunications Solutions (ATIS). ATIS is a standards body that develops telecommunications standards, operating procedures and guidelines through its committees and forums. ATIS member companies are providers of telecommunications services and include wireline and wireless service providers, local carrier's interexchange companies, manufacturers and software developers.

The need for a robust back-up for GPS was well documented in the 2001 DOT Volpe study. It was noted then that GPS signals are susceptible to interference and distortion

by ionospheric conditions, and other radio signals and obscured by tall buildings. Moreover it is increasingly evident that GPS can be subject to deliberate interference by hackers, terrorists and hostile foreign governments. More recently there is a new threat to GPS in the form of anti-satellite weaponry. ATC Reform News concludes its review of the situation with the comment that the cost of a robust back-up in the form of eLoran should not be a burden on the U.S. Coast Guard alone but shared by all user groups and agencies. The problems of a period of tight budgets and the temptation to reduce that burden by not supporting eLoran impose an immediate and serious challenge to the wider GPS user community. We should not let them get away with it. Congress should hear the loud and clear message "DON'T DUMP LORAN." ■

## Edward McGann 1934-2008

Ed McGann was born and educated in Lowell Massachusetts, receiving the BS and MA degree in Electrical Engineering from the Lowell Technical Institute (now University of Massachusetts-Lowell). In 1957 he joined Sylvania Applied Research Laboratories as a Research Engineer working in digital signal processing and antenna control systems. In 1971, Mr. McGann joined Megapulse as Vice President of Marketing. In

1975 he became Executive Vice President and member of the board of Directors. While retiring from Megapulse in 1999 he remained on the Board of directors until his death. He was holder of several patents and the author of over 30 technical papers. While Chairman of the Congressional Liaison Committee of ILA (then known as the Wild Goose Association) he lead the action of that organization which resulted in the designation of Loran-C as the

National Navigation System for all of the US Coastal waters. In recognition of his outstanding contributions to the development of the Loran-C Navigation System, Ed was elected a Fellow of the Institute of Navigation and was a recipient of the Medal of Merit, the highest award of the International Loran Association.

He is survived by Alice, his wife of 50 years, son Brian, daughters Judith McGann and Patricia Strand, and three grandchildren. ■

## **RTCM Special Committee 127 to meet May 6 and 7, 2009**

RTCM Special Committee 127 on Enhanced Loran will meet on 6-7 May 2009 at the Trade Winds Island Grand Hotel in St. Pete Beach, FL, as part of the RTCM Annual Meeting and Conference. The meeting begins at 1 p.m. on Wednesday.

Revision 0.6 Draft Receiver Standard has been posted at the RTCM document website

<http://rtcm.info/sc127/084-2009-SC127-049.doc>

## **RTCM Board urges continued funding for eLoran**

Concerned by recent statements from the U.S. Coast Guard that it planned to discontinue Loran-C operations and the fact that the Administration's proposed budget for FY 10 lacks funds for the implementation of eLoran, the Board of Directors of the Radio Technical Commission for Maritime Services (RTCM) has sent letters to those members of the U.S. Congress who are in positions to influence the future of eLoran.

This letter urges the continued operation of the present Loran-C at the existing stations until they have been upgraded to eLoran

## **Cross-Rate Technology cited at Miami Boat Show for innovative design**

Cross-Rate Technology of Windham, Maine, USA was honored in February 2009 to receive recognition by the Boat Writers International (BWI); the National Marine Manufacturers Association (NMMA) and the Miami International Boat Show for the innovative design of their recently announced eLGPS 1110 integrated GPS/eLoran receiver. It was given an Honorable Mention by the NMMA Innovation Award Committee for Consumer

This draft document is part of an on-going effort by members of RTCM SC127 to put in place performance standards, methods of testing and required test results for Enhanced Long Range Aids to Navigation (eLoran). The Special Committee met in London, October 31, 2008 during Nav08/ILA37, and subsequently on January 29, 2009 during the ION Convention in Anaheim CA. The Summary Record of each meeting can be found in the RTCM Meeting Document posted at <http://rtcm.info/sc127/>.

It is expected that M. Cedric Quivouron will attend the meeting.

standards. It was noted that in February 2008 the Department of Homeland security (DHS) announced that satellite-based navigation required a secure backup system to provide Position, Timing and Navigation data and it was further agreed at this time that eLoran would be the most appropriate and effective back-up system. The 2008 Federal Radionavigation Plan (FRP) released by the new administration in February 2009 affirmed that the decision to implement eLoran as GPS backup was based on the findings of an Independent Assessment Team of the Institute of Defense Analysis (IDA).

This action to define eLoran as the backup to GPS was widely

Electronics and Software. Zachariah Conover, president and CEO of CrossRate Technology LLC, is currently vice-president and member of the Board of Directors of the International Loran Association (ILA).

The Innovation Awards recognize products that demonstrate, innovative distinction from other current products, show benefit to the marine industry and/or the customer, demonstrate practicality, cost effectiveness and availability.

The eLGPS 1110 receiver delivers positioning information by integrating a state of the art GPS

He is Project Manager of Direction des Constructions Navales Services (DCNS) Division in France which has been concerned with the maintenance of Loran transmitters and support of the French Loran transmitting system and Control Center.

The meeting agenda is posted at <http://rtcm.info/sc127/080-2009-SC127-048.doc>. It is expected that these sessions will, in particular, review those sections of this current draft reviewing information specifically related to the performance standards of eLoran for harbor entrance and approach. ■

applauded in the US and in the international navigation community and has stimulated related investment and eLoran development worldwide.

In conclusion the letter re-asserts that RTCM urges the support by the Congress of funds to continue Loran-C as it is phased into eLoran. In view of the unique experience and qualifications of the US Coast Guard, the letter goes on to advocate that this agency be tasked with the continuing process of current operation and eLoran conversion until a possible transition to contractor responsibility under DHS is put in place. ■

receiver with a high quality eLoran receiver. It is to be noted that this receiver system provides true heading information even when stationary for radar overlays and autopilot use. The receiver uses the I<sup>2</sup>E integration engine with a Kalman Filter working in real time to integrate the GPS and eLoran position information.

Further information on Cross-Rate Technology and the eLGPS receiver can be found at their website [www.CrossRate.com](http://www.CrossRate.com) ■

## Senate Commerce Committee urges full support for the transition of Loran-C to E-loran

In a letter to the Senate Budget Committee, Senator Rockefeller, chair of the Senate Commerce Committee, expressed the views

of the Committee in regard to the estimates for the FY 10 budget resolution urges a budget of \$ 9.4 billion for the US Coast Guard to fully fund and support the security and non-security missions of the agency. In addition to expressing support for the annual re-authorization of USCG funding levels, the

committee emphasized the need for continued support of Committee priorities which specifically includes the maintenance of Loran-C while the transition to eLoran is accomplished. ■

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## Members of Congress

RTCM has provided the following list of those in Congress who might be concerned with some aspect of eLoran funding and to whom comments in support of eLoran might be directed.

The Honorable Maria Cantwell  
Chair, Subcommittee on Oceans, Atmosphere, Fisheries and Coast Guard  
U.S. Senate  
Washington, DC 20510

The Honorable Mark Begich  
Member, Committee on Commerce, Science, and Transportation  
U.S. Senate  
Washington, DC 20510

The Honorable Olympia J. Snow  
Ranking Member, Subcommittee on Oceans, Atmosphere, Fisheries and Coast Guard  
U.S. Senate  
Washington, DC 20510

The Honorable Jay Rockefeller  
Chairman, Committee on Commerce, Science, and Transportation  
U.S. Senate  
Washington, DC 20510

The Honorable John F. Kerry  
Chairman, Subcommittee on Commerce, Science and Transportation  
U.S. Senate  
Washington, DC 20510

The Honorable Kay Bailey Hutchison  
Ranking Member, Committee on Commerce, Science, and Transportation  
U.S. Senate  
Washington, DC 20510

The Honorable John Ensign  
Ranking Member, Subcommittee on Commerce, Science and Transportation  
U.S. Senate  
Washington, DC 20510

The Honorable Byron L. Dorgan  
Chairman, Subcommittee on Aviation Operations, Safety and Security  
U.S. Senate  
Washington, DC 20510

The Honorable Jim DeMint  
Ranking Member, Subcommittee on Aviation Operations, Safety and Security  
U.S. Senate  
Washington, DC 20510

The Honorable Elijah E. Cummings  
Chairman, Subcommittee on Coast Guard and Maritime Transportation  
House of Representatives  
Washington, DC 20515

The Honorable Don Young  
Member, Subcommittee on Coast Guard and Maritime Transportation  
House of Representatives  
Washington, DC 20515

The Honorable Harold Rogers  
Ranking Member, Subcommittee on Homeland Security  
House of Representatives  
Washington, DC 20515

The Honorable David E. Price  
Chairman, Subcommittee on Homeland Security  
House of Representatives  
Washington, DC 20515

The Honorable John W. Olver  
Chairman, Subcommittee on Transportation, Housing and Urban Development, and Related Agencies  
House of Representatives  
Washington, DC 20515

The Honorable David R. Obey  
Chairman, Committee on Appropriations  
House of Representatives  
Washington, DC 20515

The Honorable James L. Oberstar  
Chairman, Committee on Transportation and Infrastructure  
House of Representatives  
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The Honorable John L. Mica  
Ranking Member, Committee on Transportation and Infrastructure  
House of Representatives  
Washington, DC 20515

The Honorable Frank LoBiondo  
Ranking Member, Subcommittee on Coast Guard and Maritime Transportation  
House of Representatives  
Washington, DC 20515

The Honorable Jerry Lewis  
Ranking Member, Committee on Appropriations  
House of Representatives  
Washington, DC 20515

The Honorable Tom Latham  
Ranking Member, Subcommittee on Transportation, Housing and Urban Development, and Related Agencies  
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# Positioned for the future



Innovators in advanced navigation and communication concepts  
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## 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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