



# Loran Lines

September 2009

Newsletter of the International Loran Association

Volume 2009-2

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## Expert opinion: Congress will support eLoran

Speaking at the 2009 Satellite Navigation Conference in Munich, Dr. Brad Parkinson expressed the opinion that there were three GPS requirements that have not been adequately addressed: worldwide availability, interchangeability of satellite data between GPS, GLONASS, GALILEO and COMPASS formats, and the recognition that satellite signals are intrinsically weak and subject to contamination from various forms of interference. Parkinson, professor emeritus at Stanford University and Director of GPS and Deputy Chair of the US Position, Navigation and Timing (PNT) Advisory Council, is widely known and respected for his extended role in the creation and implementation of the present GPS system.

In a recent interview with Inside GNSS magazine he expressed the opinion that current disagreements within the various branches of the US Government regarding the deployment of eLoran as the primary GPS backup would be resolved. In his opinion the probability of final approval was 75 to 80 percent. See the full Inside GNSS article reporting the issues presently under debate at:

[www.insidegnss.com/node/1615](http://www.insidegnss.com/node/1615)

The need for a backup to GPS and the suitability of an enhanced updated form of Loran (eLoran) has, over the last year, been the subject of conflicting Agency opinions and inconsistent executive decisions. Most of the findings of various committees and the actions of government agencies and of the Congress, which are the fabric of this dispute, have been reported in past issues of *Loran*

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## GAO cites danger of possible future deterioration in GPS services.

In report GAO-09-325 prepared for the Subcommittee on National Security and Foreign Affairs, Committee on Oversight and Governmental Reform the General Accountability Office (GAO) presents a broad review of the Global Positioning System (GPS), its program for the acquisition of new satellites, ground control equipment, and coordination with other Federal agencies.

The panel found that there were significant challenges ahead in sustaining and upgrading the widely used capabilities of GPS.

The report observes that the Air Force has encountered numerous technical problems that impact delivery schedules and at the same time been subjected to significant limitations in the overall system budget. In addition the report points out problems within the GPS community that appear to suggest both a lack of internal coordination and an inadequate means for overall system management. If not recognized and corrected, these problems can result in a system that falls below the number of satellite units required to maintain the global system at its committed levels.

The GAO report occurs at a critical time. It is a significant positive contribution to the current discussion of a need for a backup system for GPS. Its independent findings clearly strengthen the case of those who have urged that a viable backup system is urgently needed and that this can be provided by eLoran.

Highlights of the GAO report can be found at:  
[www.gao.gov/highlights/d09325high.pdf](http://www.gao.gov/highlights/d09325high.pdf) ■



**The Navigation Conference & Exhibition ILA38**

October 13–15, 2009 in Portland, Maine, USA

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# International Loran Association

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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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## Expert opinion

*Continued from page 1*

*Lines.* A brief but excellent summary of the present state of this continuing contest between those who have steadfastly supported the growth of eLoran and those who declare that GPS can be a sole source of navigation and timing information is presented in the July/August issue of Inside GNSS. To those who have followed the fortunes and misfortunes of eLoran, the characterization of this relation as a seemingly never ending story seems to be only too true. The forces opposing eLoran have long sought to obscure and downplay the increasingly evident vulnerability of GPS and to reject the need for a second source as a backup that would preserve the continuity of navigation, position and timing information under all conditions.

During the period from 1997 to 2007, Congress has supported a

continuing program for the upgrading and expansion of Loran to eLoran to the point that many feel that the transition is nearly 70% complete. The U.S. Government Accountability Office (GAO) in an April 2009 report to the Subcommittee on National Security and Foreign Affairs and the Committee on Oversight and Government Reform of the U.S. House of Representatives cites the increasing age and a possible decline of the GPS system and consequent deterioration in signal availability and quality.

An earlier report from the DOT Cambridge Volpe Center, originally prepared in 1998 but only released in September 2001 at the meeting of the Civil GPS Service Interface Committee (CGSIG) in Salt Lake City, disclosed the basic vulnerability of GPS due to the low energy signal, adequate for normal operations, but insufficient to combat even modest noise intrusion levels.

It was pointed out that this interference could arise from natural causes, accidental malfunction of radiating systems or deliberate jamming.

The prestigious Independent Assessment Committee Team recently went on record with a unanimous recommendation that a back-up is needed and that eLoran was the best candidate system to fill that role.

Shortly after the Federal Navigation Plan 2008 was published, proposing eLoran as a back up to GPS, the administration in an abrupt announcement advocated the termination of the Loran system as a budget cutting measure. The matter is now pending before the U.S. Congress in the form of several different Appropriation Bills. ■

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## Funding bills in Congress differ on the support of eLoran

While the White House is seeking to eliminate funding for eLoran and to terminate the Loran system as a budget cutting measure, the House Appropriations Committee has acted to rejected termination. The language in the House version of the Appropriation bill passed on June 24, 2009 directs the U.S. Coast Guard to provide a plan for the upgrading of the current system to an enhanced loran termed eLoran. The Senate version would provide for the termination of Loran if, in the view of the Commandant of the Coast Guard, eLoran was not needed as a backup to GPS.

In a recent report on the debate in the U.S. Congress relating to the support of the Loran system, GPS World magazine asserts that Loran has become a political football. Those urging its termination have displayed a disconcerting ignorance of the nature

of the national Loran system and its present configuration. In the subsequent debates on the amendment to terminate, Sen. Collins (R) Maine pointed out the consistent ongoing support by past Congresses to update the Loran system, and further that over the past five years several study groups have pointed out that GPS has exhibited significant vulnerabilities to interference and an increasing history of system outages and periods of deterioration of signal quality.

In addition to problems related to system maintenance and low satellite signal levels, GPS is demonstrably vulnerable to deliberate interference or jamming by simple means readily available to terror groups. As basic infrastructure already in place, Loran is a foundation for the evolution of a GPS backup. An enhanced Loran will be the most compatible system and cost effective system to provide this necessary function. In subsequent remarks Senator Collins pointed out the recent unanimous finding of the Independent Study Commission that eLoran

was the ideal candidate for GPS support, providing a similar digital data stream for navigation, positioning and timing information.

In light of the over 40 billion dollar budget proposed for the Department of Homeland Security, the allocation of a hundred million dollars to put in place and maintain a significant system which would serve to assure the continuity of the nation's PNT infrastructure is a necessity. To delete such support in the name of budget considerations is a folly based on a serious and troubling ignorance of the need.

The difference in the terms of the House and Senate appropriation measures will be resolved by a Joint Committee meeting after the Summer Recess. Every effort should be made by those concerned to prove to the committee members the full significance of the need for eLoran and the positive values in its continued support. ■

## **RIN announces new format for NAV 09 Conference.**

NAV 09, the annual technical conference of the Royal Institute of Navigation in November 2009, will be organized into five separate conferences in four different locations in the UK with each venue hosting a different navigational theme, with invited presenters as follows:

### **NAV09 – Maritime-Shipborne navigation**

Southampton Solent University  
Conference Center – 10 November

**NAV09 – Positioning & Location**  
University of Nottingham – 12  
November

**NAV09 – Land**  
National Physical Laboratory, Ted-  
dington, Middlesex – 19 November

**NAV09 – Timing**  
National Physical Laboratory, Ted-  
dington, Middlesex – 20 November

### **NAV09 – Air, Aviation and Future Trajectories**

Imperial College, London – 25  
November

Further information can be obtained at the RIN website:

[www.rin.org.uk/news-events/  
events/nav09-conference-exhibition-1](http://www.rin.org.uk/news-events/events/nav09-conference-exhibition-1) ■

## **International Association of Institutes of Navigation (IAIN) will meet in Stockholm in October 2009**

The 13th World Conference of IAIN will be held in Stockholm, Sweden on October 27–30. The Congress is arranged by the Nordic Institute of Navigation, Lars Magnusson, President.

The Congress covers navigation and positioning defined in a very broad way including air navigation, eNavigation, high precision geodynamic positioning as well as GNSS development and modernization, integrated navigation systems eLoran and much more. The Congress will be composed of plenary sessions, technical presentations and poster sessions. There will be an exhibition and a social programme. It is expected to be one of the major network-

ing opportunities of the year. The Congress language will be English.

Additional information on exhibition and sponsorship opportunities can be found at  
[www.congrex.com/nnf/iaain2009/Exiband.asp](http://www.congrex.com/nnf/iaain2009/Exiband.asp)

Additional information on the social programme can be found at  
[www.congrex.com/nnf/iaain2009/socprog.asp](http://www.congrex.com/nnf/iaain2009/socprog.asp)

Questions relating to the exhibition, conference, registration and on Stockholm and Sweden in general can be directed to the Secretariat at [iaain2009@congrex.se](mailto:iaain2009@congrex.se) or phone +46.8.459.66.00 ■

## **Aircraft Owners and Pilots urge continuation of eLoran**

In a recent news release AOPA, the Aircraft Owners and Pilots Association, once more reiterated their stand that eLoran is an essential backup for GPS and its development should be supported by the Congress. Craig Spence, AOPA vice president for regulatory affairs, stated that "In the event of a GPS outage it is important to have a separate ground-based navigation system in place. AOPA has long cautioned against decommissioning Loran before a backup system is in place." The bill passed by the House provides funding for the Department of Homeland Security for the next year and rejects the termination of Loran as was proposed by the Administration. In support of this position AOPA cites the evidence of a need for a GPS backup presented in a recent report from the U. S. Government Accountability Office which states that delays in the development

and launch of new satellites could lead to interruption in GPS services as soon as next year. ■

## **Reason Foundation faults administration failure to support eLoran**

In an article which points out the urgent need to support future eLoran development as a backup to GPS, the May 2009 issue of ATC Reform News urges everyone with a stake in the viability of GPS to speak out and lobby to reverse the administration proposal to defund Loran. On the same day in May that the GAO warned of potential gaps in GPS coverage and services; plans were announced in Washington to cancel eLoran, the approved backup system for GPS. Reform News cites the oft referenced study by the Independent Assessment Team (IAT) quoting its resounding declaration "The IAT

unanimously recommends that the U.S. Government complete the eLoran upgrade and commit to eLoran as the national backup to GPS for 20 years." In some way these clear and unambiguous findings plus the declaration by the Department of Homeland Security "DHS will begin implementing an independent national position, navigation and timing system (eLoran) that complements GPS" were ignored by the budget managers. In terms of the present Federal budget and spending levels, the money to assure a future eLoran backup system is trivial. GPS services are necessary not only to the air navigation community but for a diverse range of applications including 911 response location, computer network and power system timing and control, maritime navigation and national defense. In Loran and its successor eLoran we have a valuable infrastructure legacy system that must be preserved and updated to serve a very real need. ■



## The Navigation Conference & Exhibition ILA38

October 13–15, 2009 in Portland, Maine, USA

*BE THERE!*



### ILA-38 Conference 2009 in Portland Maine USA

The 38th Conference and Technical Symposium of the International Loran Association be held this year October 13, 14 and 15 at the Sable Oaks Marriot Hotel in South Portland ME USA. The meeting of RTCM Special Committee 127 on Standards for Enhanced Loran (eLoran) Systems will be held at ILA-38 on October 13.

Under the organization of Conference Chair Zachariah Conover of Crossrate Technology and Technical Chairman Christ Bartone of Ohio University a wide range of topics will be presented in the Technical Sessions to be held on October 14 and 15. Areas for which papers have been invited are shown below. ■

#### Loran around the World

Loran stations throughout the world including Europe, Far East Russia, and Middle East.

#### Marine Navigation

Marine, harbor and harbor approach, differential Loran, performance analysis for marine applications.

#### Loran System Architecture; Transmitter Station Technologies

Data messaging, timing time of transmission, unmanning, reliability and operation.

#### eLoran Receiver and Antenna Technology

All-in-view receivers, digital signal processing, applications

### Conference Calendar

- Oct 13 Board Meeting  
RTCM 127 Meeting  
Welcome Reception
- Oct 14 Plenary Session  
Technical Sessions  
Evening Reception
- Oct 15 Technical Session  
Formal Dinner

#### Loran Specifications and Standards

Signals specifications, antenna and receiver standards specifications. Loran policy, operations and maintenance of Loran stations and equipment

#### Interference to GNSS and Loran as a back-up

Loran as a back-up to GNSS, Jamming and interference issues associated with electronic navigation systems.

#### Aviation Applications

Precision and non precision approach, modeling and simulation flight tests and procedures.

### Coordinates magazine: "Loran is best – Keep it"

The strong support for eLoran as a backup for GPS by the Independent Assessment Team is reported in the June issue of Coordinates Magazine. The article points out that support by a highly qualified commission who gave their unanimous support for eLoran has occurred at a critical time for Loran in the USA where the administration and the U.S. Coast Guard have sought to throttle its development. In addition there has been strong sup-

port in previous Congresses to continue the upgrading of loran to provide a support for the evolution of an eLoran system as a qualified backup to GPS. This abrupt change in government policy has raised serious concerns among international navigation and security organizations. Previous U.S agencies had supported the development of eLoran as a means to mitigate any safety, security or economic effects of a GPS outage or disruption. It is clear that government, and commercial operations communications and utilities depend on precise timing and

that eLoran is the only wide range, unjammable backup that can provide comparable accuracy.

Coordinates is a monthly magazine on positioning, navigation and associated technologies published by the Center of Geo-Information Technologies (cGit), a non governmental organization based in Delhi India. Further information can be obtained from their website: [www.mycoordinates.org](http://www.mycoordinates.org). ■

# Positioned for the future



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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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