



Loran Lines

May 2005

Newsletter of the International Loran Association

Volume 2005-1

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FAA releases report on role of eLoran as a backup to GPS services

The Federal Aviation Agency released in December the long-awaited report on the capabilities of an enhanced Loran system to serve as an alternate to GPS and provide high quality position and timing. The charge to the committee was to determine from a technical perspective whether Loran could be used as a safe, accurate, reliable and cost effective alternate system during an outage of GPS or its augmentations DGPS or WAAS.

The evaluation shows that an upgraded Loran (eLoran) could satisfy the current aircraft non-precision approach (NPA) requirements, maritime harbor entrance approach (HEA) plus timing/frequency requirements in the conterminous United States and accordingly could be used to mitigate the effects of any disruption in GPS service.

In the future, enhanced Loran (eLoran) would continue as a low frequency, terrestrial based navigation system operating in the 90 to 110 frequency band and synchronized to Universal Time. The new system will operate with a recapitalized infrastructure, and a new signal modulation method that would enable operations to satisfy the enhanced performance requirements. Changes required to the current system include modern solid state transmitters, a new time and frequency suite, modified monitor and control equipment and operational procedures which will exploit new receiver technology.

The report is entitled Loran's Capability to Mitigate the Impact of a GPS Outage on GPS Position, Navigation and Time Applications; Mitchell J. Narins FAA Program Manager. It was prepared for the Federal Aviation Administration, Vice President for Technical Operations, Navigation Services Directorate.

A copy of the report can be obtained at the website http://ksn.faa.gov/km/navservices/navservices/tech/Loran_Eval_Report/default.aspx

RTCM 2005 conference to feature sessions on Loran-C

The 2005 Annual Assembly Meeting and Conference of the Radio Technical Commission for Maritime Services will be held from May 15 to 21 at the Tradewinds Island Grand Hotel in St Pete's Beach FL, USA. The Conference is open to both RTCM members and non-members and is structured to provide attendees with an overall update on the ever-changing world of maritime radio communication and radio navigation. The program will include paper presentations, panel sessions, workshops and RTCM Special Committee meetings dealing with a wide range of issues of current concern to the maritime community. Registration material and additional information can be found at the RTCM website <http://www.rtcn.org>. Of particular interest to readers of Loran Lines are two sessions to be held on Wednesday afternoon.

Session 3C: U.S. Government Loran-C Program Initiatives, with papers on the Loran Modernization Program by Capt. John Macaluso, USCG, Maritime Differential Loran by Lt. Anthony Hawes USCG and the Loran Data channel by ILA Board member Ben Peterson, of Peterson Integrated Positioning. The final paper in this session is on the performance of a GPS/Loran tracking system presented by Dr. Jim Carroll of DOT Volpe Center whose report

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ILA34 Convention and Technical Symposium

October 17 – 19, 2005, in Santa Barbara, California

Be there!

International Loran Association

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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

MEMBERSHIP

NOW is the time to renew your membership! There is an on-line membership form at 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.

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

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When paying by wire transfer, please notify the Operations Center by e-mail or by FAX that a transfer is on the way, along with the amount and what it is for.

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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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on the vulnerability of GPS to interference presented at CGSIG in Salt Lake City on September 10, 2001 has been central to the general awareness after 9/11 of the need for Loran as a backup system to GPS.

Session 3D: Commercial Loran-C Program, with a paper on the integration of eLoran systems with GPS presented by ILA President Dr Linn Roth; a report of the first Commercial eLoran Sensor by ILA Treasurer Erik Johnnessen of Megapulse and concluding with news on the Saudi Positioning System, a Loran/DGPS service. Presented by ILA Board member Dr. Gerard Offermans of Reelektronika.

RTCM is a non profit scientific and educational organization focusing on all aspects of maritime radio communications, radio navigation and related technologies. While now an independent membership organization, RTCM standards are incorporated by reference into US Federal Communications Commission and U.S. Coast Guard regulations.

Loran-C transmissions planned from UK site

A recent bulletin from the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) reports that the UK General Lighthouse Authorities (GLA) plan to provide Loran transmissions from an existing LF/VLF installation at the British Telecom (BT) Radio site near Rugby in Warwickshire 70 miles NW of London. The trial period of operation during 2005 and 2006 will allow potential users to evaluate a modern Loran-C systems as a backup to Global Navigation Satellite Systems

The vulnerability of satellite based systems to interference, both accidental and deliberate, is a substantial justification for the creation of a robust backup system.

Currently Loran-C can provide excellent navigation and timing information. When used in connection with the new generation of eLoran receivers which will incorporate the capability for on-line corrections for variations in ionospheric propagation, the so-called ASF correction, Loran-C will provide positioning information comparable GPS. Operating within NELS the Northwest European Loran System, the Rugby signal will provide high quality timing service over the UK and improved Loran performance for much of Europe. Potential users are encouraged to evaluate the systems and provide feedback.

Notice to Mariners (Scotland) urges use of Loran-C as a navigational backup to GPS

In a Notice to Mariners (#10 of 2005) from the Commissioners of Northern Lighthouses announcing plans to initiate trial Loran-C transmissions from a location in Rugby, mariners are encouraged to use this new Loran-C resource as a backup to GPS. Users are cautioned that existing receivers will require software updates to make use of these signals. The Loran signals will be radiated with a GRI of 6731.

During the test period, these transmissions will include the "standard blink" (a periodic interruption of the first two pulses) to prevent their use in the navigation solution. Completion of the testing will be reported in a Notice to Mariners and the "blink" discontinued. Some receivers may identify this station as "Loop Head," the initial location proposed for this Y secondary of the Lessay Chain and will provide erroneous position computations as a consequence of the change in chain baseline from Loop Head (Ireland) to Rugby (UK). Users should manually deselect this station until the required equipment update has been accomplished.

The General Light House authorities expect to commence trials on or about 31 May 2005. It is anticipated that the signals will have an effective range of 1000 miles.

ILA Technical Innovation Award established to honor John M. Beukers

The Board of Directors have created a new award: The John M Beukers Award for Technical Innovation to honor John Beukers for his many years of active participation in the ILA as member, Board member and Officer. The award recognizes his leadership in the technical and policy initiatives of the ILA related to Loran-C and his many inventions and innovations which contributed to the growth and acceptance of Loran-C services.

A single award may be presented annually at the ILA Convention and Technical Symposium to that individual or organization whose innovative development is considered by the Board of Directors of the ILA to have most improved or extended the Loran-C service with the greatest positive impact on the users or service providers

Nominations will be accepted from the membership by the Awards Committee by July 1 of the award year.

Meetings

Narins and Roth report on GPS/eLoran system at NASA ICNS

The NASA ICNS (Integrated Communications, Navigation and Surveillance) Technologies Conference and Workshop provides a forum for Government, industry and academic communities performing research and technology development for advanced digital communications, navigation and surveillance security systems and associated application supporting national and global air transportation.

ICNS 2005 was held at the Hyatt Fair Lakes Hotel in Fairfax, Virginia, May 2 to 5, 2005. ILA President Linn Roth of Locus Inc. and Mitch Narins of the FAA presented a paper entitled GPS/eLoran systems as part of the Tuesday afternoon Session A3 Navigation, Systems Demonstration and Operations. More than sixty papers on a diverse range of topics including navigation, global communications, airborne internet and, air space communications were scheduled for the four day meeting.

For information on the conference see <http://spacecom.grc.nasa.gov/icnsconf/2005/agenda.shtml>

John M. Beukers Award for Technical Innovation

Paul W. Schick

Paul Schick has lead a team of hardware and software engineers in the development of the first Loran receivers to use "all-in-view" technology. His contributions have lead to significant improvements in the performance of Loran for marine and aviation navigation and position finding applications and timing. These improvements have demonstrated the potential of the existing Loran-C system and set the foundation for the evaluation and future expansion of eLoran.

ILA 33 TOKYO provides international forum for recent developments in eLoran systems

ILA 33, the thirty third Annual Convention and Symposium of the International Loran Association, met in Tokyo from October 25- 27 at the Takawana Prince Hotel, Sakura Tower. The Convention opened on Monday the 27th with a wide-ranging forum discussion of the status and performance of existing radionavigation systems and plans in several areas for the future. Subsequent sessions on Tuesday and Wednesday presented a detailed overview on the evolving character and capabilities of eLoran and the modernization of the US Loran system. The challenge to the US Loran-C community to enhance the existing Loran system to meet the requirements imposed in it if it is to serve as a backup to GPS has stimulated vigorous research in propagation analysis, signal structure, timing techniques, H- field antenna design and integrated eLoran/GPS/WAAS all-in-view receiver design. Reports on these and related areas were presented at the Conference together with results of measurement campaigns, and field tests documenting in detail the enhanced capability of eLoran.

Capt Macaluso of LSU (Loran Support Unit) USCG at Wildwood NJ USA reported on the significant progress being made in creating a new Loran. This has been a major effort carried out over the past seven years as support for the recapitalization of the US Loran network has enjoyed steady progress with sustained support provided in yearly appropriations from the US Congress. Not only new equipment but redesigned components have been installed so that new techniques such as the implementation of a superimposed Loran Data Channel (LDC) are planned for future operations. This will allow the wide area broadcasting of Differential Loran corrections. A part of the increasing technical sophistication of Loran is the recent announcement that the US systems will be transferred to Time of Transmission control. This change in control strategy is a significant plus for the development of all-in-view receivers in that each transmitter can be used independently.

Conference attendees were most appreciative of the gracious and generous hospitality of the Japanese hosts. ILA 33 was most fortunate to have enjoyed substantial local sponsorship from JCG, Japan Coast Guard, JANA (Japan Aids to Navigation Association), Sena Co. Ltd, Kodan Electronics Co. Ltd., JRC Japan Radio Co. Ltd. and Tokimec Inc. In addition support was provided by Megapulse, Billerica, MA USA, LOCUS Inc. Madison WI USA and Reelektronika B.V. of the Netherlands.

A CD of the conference proceedings will be available from ILA headquarters. This disk will be sent free of charge to all those who attended the conference. Initial distribution to attendees is expected by late April 2005.

ILA members may obtain a copy for US\$5.00. The price for non-members is US\$45.00 plus US\$5.00 for mailing.

Medal of Merit

Capt Richard J. Hartnett USCG

Throughout his career in the US Coast Guard, Capt. Hartnett has been dedicated to excellence in radio navigation. While at the USCG Engineering Center he was active in developing the first Remote Operating System.

Since 1986 he has been on the faculty of the US Coast Guard Academy developing balanced and thorough courses in radionavigation to ensure a technical competence in Loran in future operators and engineers. As head of the Engineering Department at the Academy he has continued this dedication to advancing Loran and other navigation services through his Research and Development programs.

January, 2005

Dear ILA Member,

It is now time for annual membership renewals. As you are aware, 2005 is an important year for Loran: a reorganization of the European Loran system is underway, and the UK will have a new transmitter operating in April; FERNS member nations are reviewing options to modernize their systems, and remain committed to maintaining a backup to GNSS; and in the US, extensive technical and economic evaluations have been positive, and a positive Loran policy decision is expected.

Your membership and active participation in the ILA is essential to the future of Loran, and I urge you to renew your membership immediately. The future of Loran and our organization continues to look very bright, and with that in mind, I would also ask you to consider a life membership.

I greatly appreciate your participation and look forward to working with you to provide a vibrant forum for the exchange and dissemination of Loran information to a growing international audience.

Best regards,

G. Linn Roth, Ph.D., FRIN
President

2003 Technical Symposium Outstanding Service Awards

Tom Celano

For his contributions to Loran and the Association as General Chair of the International Association 32nd Annual Convention and Technical Symposium 2003

Dr. Ben Peterson

For his contributions to Loran and the Association as Technical Chair of the International Association 32nd Annual Convention and Technical Symposium 2003

Amy Fitzgerald

For her contributions to Loran and the Association in planning and organizing the International Association 32nd Annual Convention and Technical Symposium 2003

Best Paper Award:

Dr. Per Enge Stanford University *Integrity Certification Overview*
presented at the 32nd Annual International Loran Association Convention
and Technical Symposium 2003.

William J. Polhemus Student Paper Award:

Wouter Pelgrum Technical University of Delft *Integrated GPS/Loran Sensor for Maritime Applications*
presented at the 32nd Annual International Loran Association Convention and Symposium 2003

A slightly belated Happy New Year, everyone!

After an excellent 33rd Convention and Technical Symposium in Tokyo last October, we are already planning for the 34th meeting, in Santa Barbara, California, USA. October 17-19, 2005 are the dates, and more details will be forthcoming very soon. We're already finishing up contract talks with the hotel and conference facilities which can accommodate us. See the attached information sheet. (If you have trouble opening this sheet, the same information will be available on the ILA website www.loran.org in the EVENTS section.)

The CD for the Tokyo meeting is in progress. All the necessary files have been collected (unless there are authors who still plan to submit papers to accompany their slide presentations).

Now it is time to renew memberships! We have an online membership form at www.loran.org for your convenience. Either renew your own individual 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. You may, of course, print the online 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.

Thank you for your continuing interest in Loran, and in the ILA. Save the October 17-19 dates for the Convention, and plan to come early to enjoy the weekend in beautiful Santa Barbara. There's even a social at Ellen and Bob Lilley's home on Sunday night, October 16, for the early arrivals.

Ellen Lilley
ILA Operations Center

Positioned for the future

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



Eurofix Reference Station/ Integrity Monitor (RSIM)

This Eurofix System allows conversion of any Accufix Loran transmitter to enable Eurofix service. Manufactured in partnership with, and utilizing the algorithms and software of **reelektronika, b.v.** The RSIM is designed for autonomous operation with either local or remote control interface. Broadcast message types include dGPS, dLoran, and SMS. Single RSIM as shown is also available in fully redundant configuration.



Megapulse

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Loran Receivers for Time, Frequency and Navigation Applications

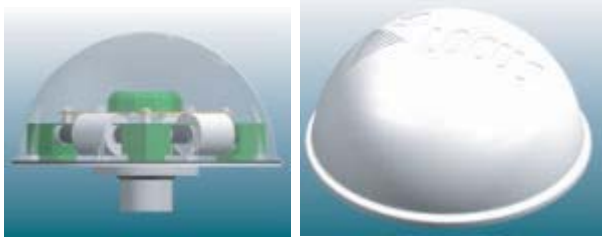


- All-in-view station acquisition/tracking
- 12 chain, 40 station capabilities
- Adaptive interference cancellation
- E-Field or H-Field antenna operation



- NMEA 0183 output messages
- Cesium-like (Stratum 1) frequency performance
- Independent UTC source
- Time and frequency outputs

H-Field Antennas for Time, Frequency and Navigation Applications



Locus H-Field antenna shown in new radome enclosure.

- P-static immunity
- Small form factor
- No ground required
- Penetration into non line-of-sight areas
- Can be integrated with GPS into single unit for a comprehensive time, frequency and navigation solution

Industrial Radios for Demanding Applications



OS2400-HSE

- 20+ mile range
- 11 Mb/s over the air
- 802.11b compatible
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- Best industrial 802.11 solution
- 3-year warranty
- Applications include security, cameras, factory/building automation, industrial LAN/WAN



OS2400-E/STE/485/OF

- 16 mile range
- Extensive networking capabilities
- Ethernet, serial-to-Ethernet, serial
- Most robust solution for difficult environments
- 3-year warranty
- Applications include remote monitoring, oil/gas, water treatment, factory, SCADA