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Loran

message

Newsletter of the International Loran Association

Volume 2008-1

2008: At Last, The Year of Loran

Hon. Langhorne Bond, President International Loran Association

On Monday, February 5, *Anno Loran*, word flashed around the world that the United States had finally announced publicly that LORAN would be continued and modernized for the long term. Champagne corks popped around the world.

This is a very personal moment for me:

my journey to secure satellite-based Position, Navigation and Timing (PNT) with LORAN began with skepticism, ridicule and some anger from the GPS-only crowd. But my journey is only 10 years long. Most folks in the LORAN movement have been believers for a lifetime and have done excellent professional work for many years. Indeed, it is the work of the pilots, navigators, and radio-navigation experts whose papers, all positive, have achieved success. I salute this dedicated band of true believers and offer my thanks. The world – all countries on all sides of the political divisions – will soon be a safer place.

Now, in an instant, we are suddenly members of the establishment! We will have to learn how to be respectable. For me, this will require some effort. It's not in my DNA.

For the future, the opportunities are boundless. We now begin the search for applications. Aviation, maritime, land navigation, military, telecom, almost everywhere GNSS goes, LORAN can follow as a complementary companion. LORAN and GNSS: a partnership made in radio-navigation – pardon me – *PNT* heaven.

The work has already begun. As a dedicated Europhile, I am pleased that the Europeans are leading the way. The Americans have been stalled in recent years. Now our vessel is away from the dock and underway.

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February 7, 2008 Contact: (202) 282-8010

STATEMENT FROM DHS PRESS SECRETARY LAURA KEEHNER ON THE ADOPTION OF NATIONAL BACK-UP SYSTEM TO GPS

Today the U.S. Department of Homeland Security will begin implementing an independent national positioning, navigation and timing system that complements the Global Positioning System (GPS) in the event of an outage or disruption in service.

The enhanced Loran, or eLoran, system will be a land-based, independent system and will mitigate any safety, security, or economic effects of a GPS outage or disruption. GPS is a satellite-based system widely used for positioning, navigation, and timing. The eLoran system will be an enhanced and modernized version of Loran-C, long used by mariners and aviators and originally developed for civil marine use in coastal areas.

In addition to providing backup coverage, the signal strength and penetration capability of eLoran will provide support to first responders and other operators in environments that GPS cannot support, such as under heavy foliage, in some underground areas, and in dense high-rise structures. The system will use modernized transmitting stations and an upgraded network.

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Awards – pages 6 & 7



Nav08 The Navigation Conference & Exhibition ILA37 October 28 – 30, 2008 in London U.K. BE THERE!



International Loran Association

Board of Directors and Committee Chairs 2007 - 2008

President:	Langhorne Bo Robert W Lil	ond lev	dnirella@nc.rr.com Robert Lilley@cox.net		
Traceurer	Emil: Johanna	icy			
Treasurer:	Effk Johannes	ssen	enkj@megapulse.com		
Past Preside	ent:				
Linn Roth		rothlinn@	sbcɑlobal.net		
John Beukers		ib20@comcast.com			
Joini De	arterb	JDLO O O O O			
Elected Dire	ectors:		_		
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Marc Clerens		marc@els	isag.com	2010	
Thomas Gunther		GTGunthe	er@aol.com	2008	
Tamotsu Ikeda		ikedat@s-	vans.com	2010	
Erik Johannessen		erikj@meg	gapulse.com	2008	
Robert Lilley		Robert.Lil	ley@cox.net	2009	
Sherman Lo		daedalus@	estanford.edu	2008	
Jacques Manchard		Jacques.M	lanchard@equipment.gouv.fr	2009	
Gerard Offermans		G.Offerma	ins@reelektronika.nl	2010	
Chuck Schue		cschue@ເ	irsanav.com	2010	
Paul Williams		paul.willia	ms@thls.org	2009	
Durk va	n Willigen	D.vanWilli	gen@reelektronika.nf	2009	
Appointed I	Directors (one	vear term)			
David Diggle		digale@ol	nio.edu	2008	
Douglas	Taggart		Daol com	2008	
Zachary	v Conover	zconover	@crossrate.com	2008	
Co-Editors LORAN LINES					
Albert Frost		albert.fros	st@unh.edu		

Otis Philbrick ophilbrick@earthlink.net

A complete listing of the Board Membership, addresses, affiliations and phone/fax numbers can be found on the ILA website: **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 or www.loran.org/Membership/FormCorporate.htm

> Please note ILA's web site address: www.loran.org and e-mail address: ila@loran.org

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> Fax: +1 805-967-8471 e-mail: ila@loran.org www.loran.org

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:

> Albert Frost Kingsbury Hall University of New Hampshire Durham NH 03842 USA tel: +1 603-862-1306 fax: +1 603-862-1832 **albert.frost@unh.edu**

Otis Philbrick 14 Wild Cherry Drive Mills River NC 28759 USA **ophilbrick@earthlink.net**

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The details of the US decision – funding, management, etc. – are still a bit unclear and I won't attempt to predict the specifics. By the end of the year 2008 we will know more. But we can be certain that all 24 LORSTAS will continue, modernization will continue, several new transmitters will be built, and one or two may be relocated. It is also almost certain that the LORSTAS will be automated and de-manned, as the Europeans have been doing for years. Private companies take notice.

A word about the U.S. Federal Radio Navigation Plan, aka the FRP. The FRP is supposed to be published every two years. Recently it has been delayed because of the delay in the LORAN decision. Work is now under way with a target date of 31 September 2008. LORAN will be included in the FRP. Let me add that many in the world radio navigation community attach too much significance to the U.S. FRP. It is not a statement of future U.S. policy. The real action is in the Congress, the Executive Branch, and in the user community. For the true state of play in the U.S., contact the International Loran Association.

In recent years we have heard the comment that the ILA is too U.S.-centric. The comment is valid, but, in light of the enormous importance of the U.S. decision, the U.S. focus was probably in everyone's interest. But the ILA is changing. Now the ILA board of directors has a large component of non-U.S. members. I have agreed to stand for re-election for one more year only. In 2009 we are seeking a non-U.S. citizen to serve as President. In 2009 our annual meeting will probably return to the U.S. to hear the implementation of the U.S. decision. UK Trinity house's Dr. Sally Basker and I agree that San Francisco would be a splendid venue. Why not? LORAN is in the big time now. But in 2010 the ILA will surely go outside the U.S. and, I hope, will continue to do so. Suggestions for a 2010 venue are welcome.

The 2009 ILA annual meeting will be at Church House, Westminster, London, from October 27 through October 30. The Royal Institute of Navigation has kindly invited the ILA to co-sponsor its annual meeting. Much thanks to David Last, David Broughton, and the RIN board for the invitation and for the support for LORAN over the years. We will get a report on the General Lighthouse Authority's splendid new LORAN station, the first in many years, installed, operated, and owned by VT Systems – an example of European leadership. This will be a celebratory meeting and will feature, I am sure, the demolition of many bottles of Champagne. I urge everyone to attend.

Finally I thank the members of the ILA for according me the honor of serving as your president. The friendships of many people around the world, and the achievements of our dedicated band, are the highlights of my life.

Langhorne Bond President

DHS adopts eLoran as backup for GPS

In a brief news release dated February 7, 2008, the Department of Homeland Security (DHS) announced that it will begin implementing eLoran as an independent national positioning, navigation and timing system to complement the Global Positioning System (GPS) in the event of an outage or disruption in service. In addition to providing backup coverage, the statement points out that the eLoran signal has the strength and ability to support first responders in underground areas, in structures and environments like heavy foliage that cannot be provided by GPS.

In the President's FY09 budget, the Department of Homeland Security (DHS) is named as Executive Agent for the development of a national backup for critical systems used in position, navigation and timing (PNT). Enhanced eLoran is identified as the primary candidate for the backup. In 2009 the administration of the Loran-C program will migrate to the National Protection and Programs Directorate (NPPD) in preparation for the conversion of Loran-C operation to eLoran. It is expected that the system will continue in operation under the U. S. Coast Guard throughout 2009.

When first proposed, the potential accuracy of GPS made it an immediate candidate as a basic navigation tool when the full constellation of satellites was activated. It was advocated that all other air and land navigation aids then in place – buoys, light houses, beacons and Loran – be decommissioned. Arguments for efficiency and economy were made. It was stated in the FRP that Loran would be discontinued. Many in the navigation community were opposed to a decision that would result in a sole-source of navigation data that would be unavailable in the case of system

failure. They persuaded Congress to continue providing funds for both Loran operation and progressive development. The events of 9/11 and the clear evidence of aggressive and technically sophisticated terrorism added new urgency to the demand for a backup to GPS. Since then the technology base of Loran in transmitters, receiver design, antenna systems and signal processing has made significant progress. It has demonstrated to numerous highly critical review and assessment teams that an eLoran system could provide the level of PNT support required to qualify as a full backup for GPS. Much future work is required to put in place a fully operational system and the needed infrastructure in terms of performances standards, receiver integration, and mapping aids, but a significant benchmark has been achieved and the future of eLoran is exciting indeed.

UK eLoran Station Anthorn declared operational

The General Lighthouse Authorities have declared the eLoran station at Anthorn, Cumbria, Northern England operational from the15th of January 2008 at 8:14 UTS. At this time station "blink "was removed by the Control Center at Brest. In announcing the official inauguration of service from Anthorn, the newsletter of the Commissioners of Irish Lights declared that eLoran service will reinforce safety, security and protection

Basker heads RIN Special Interest Group for eLoran

Dr. Sally Basker, Director of Research and Radio Navigation at Trinity House for the GLA of the UK and Ireland, and recipient of the ILA Medal of Merit at ILA36, now heads a recently organized eLoran Special Interest Group (SIG) within the Royal Institute of Navigation reflecting the increasing interest and participation in eLoran-based navigation aids.

Government agencies and private sector organizations concerned

Bond awarded the Engen Trophy for Aviation Excellence

The Aero Club of Washington recognized the contributions to aviation of ILA President Langhorne Bond at a luncheon meeting on November 28, 2007, awarding him the Donald Engen Trophy. The Trophy, named for the late Admiral Engen, is given to an individual, team or organization for a lifetime of achievement in aviation. Previous recipients have included Scott Crossfield, pioneering test pilot and Astronaut, Don Lopez, Deputy Director of the National Air and Space Museum, and Alan Boyd, first Secretary of Transportation.

In making the presentation, Jeffery N. Shane, DOT Under Secretary for Policy, traced Langhorne's long connection with the founding and subsequent operation of DOT. Starting as a special assistant to Alan of the marine environment around the coasts of the UK and Ireland. This marks the culmination of a period of extensive calibration and testing during which the Cumbrian station was integrated into the present European Loran network of stations.

VT Communications, under a 15-year GLAs contract, relocated the existing eLoran transmitter at Rugby to a new site in Cumbria, installing a new antenna as reported in previous issues of *Loran Lines*. First test signals were broadcast in October 2007.

with the future development of electronic navigation in Europe have applauded the recent decision by the U.S. to move toward the implementation of eLoran as a complement to GPS. With the deployment of the new eLoran station in Cumbria and the existing stations in Norway, France, Germany and the Faeroe Islands, a trial eLoran service network is now operational in Northern Europe.

There is an increasing demand that a European Navigation Plan (ENP) based on Galileo, GPS and eLoran be created. This plan would

Boyd, at that time Under Secretary of Commerce, Langhorne's task was to lobby the transportation associations and Congress for the passage of what became the DOT Act. When Boyd became the first Secretary of Transportation in 1966, Langhorne joined the new Department becoming assistant administrator of the Urban Mass Transportation Administration during his final year.

In 1977 President Carter appointed Bond as Federal Aviation Administrator. While at the FAA he initiated the development of TCAS, the Traffic Alert Collision Avoidance System and implemented the Ground Proximity Warning System. Leaving the FAA in 1981, he has since been a widely sought-after aviation consultant.

In the past decade, Langhorne has been concerned with both the opportunities and the challenges of satellite-based navigation. With the advent of GPS, a technology that Commenting on this development Dr. Sally Basker, Director of Research and Radionavigation for the GLA's, pointed out "eLoran allows users to retain their GNSS levels of navigation safety even when satellite services are disrupted. The international maritime community now understands that the future digital e-Navigation environment needs an internationally agreed alternative system to GNSS and eLoran is the only viable candidate."

look forward to the establishment of a reliable position-navigation-timing (PNT) service with the diversity of satellite and land based signal sources as a protection for when space-based services are disrupted.

Special Interest Groups give members of the Royal Institute of Navigation a chance to get the latest information, share views with leading experts and attend events related to their particular sphere of concern. For additional information see the Institute Web site **www.rin.org.uk**

might be considered to provide a sole source platform for air traffic management, he was one of the first to raise a cautionary flag, pointing out that the low energy satellite signals might be subject to malfunction or jamming. His concerns were validated by a subsequent study conducted by the Volpe Research Center documenting the potential vulnerabilities of GPS. These findings, vigorously presented by Langhorne before many committees and at numerous meetings, were supported by a significant segment of the navigation community and resulted in a Presidential Security Directive that there be a formal identification of a backup system to GPS.

Shane pointed put that beyond his contributions to aviation, Langhorne Bond is admired by many who find him unfailingly honest, an iconoclast who calls them the way he sees them and who is in so many ways larger than life: "a raconteur, a bon vivant, a man about town."

ILA Convention in London

28 – 30 October 2008 NAV08 THE NAVIGATION CONFERENCE ILA37 & EXHIBITION NAVIGATION AND LOCATION: WE ARE HERE

Once more the Royal Institute of Navigation and the International Loran Association have combined the individual annual conferences (NAV08 and ILA37) to provide a forum on the evolution of navigation technology and practice. The conference will bring together users and R&D specialists and include training sessions on 27 October 2008 covering many aspects of eLoran and GNSS.

A preliminary listing of Session Topics includes eLoran, Location Based Services, Road and Rail Applications, GNSS Infrastructure and many more of interest to members of ILA.

NAV08/ILA37 is being sponsored by several major organizations: DGON, The German Institute of Navigation; NIN, the Netherlands Institute of Navigation; IET, Institute of Engineering and Technology; KTN, Locations and Timing; NI, The Nautical Institute and UKSpace.

With the Royal Institute of Navigation as host, the conference will be held in Church House near Westminster Abby and the Houses of Parliament. Church House, constructed in 1937–40 as headquarters for offices of the Church of England, served during Word War II as a meeting place for the Parliament after the bombing of the Palace of Westminster and housed the first sessions of the United Nations Security council.

Conference Deadlines:

Receipt of synopsis	2 May 2008
Notifications of acceptance	27 June 2008
Receipt of full paper	17 October 2008

Further information can be found on the ILA website www.loran.org or the RIN website www.rin.org.uk or

ILA Operations Center		The Royal Institute of Navigation
741 Cathedral Pointe Lane	or	1 Kensington Gore
Santa Barbara, CA 93111 USA		London SW7 2AT UK

Initial meeting of RTCM Committee 127 on eLoran held at ILA36

Following the proposal that was made at the RTCM Annual meeting in St Pete's Beach in May 2007, the Board of Directors approved the establishment of RTCM Special Committee 127 on eLoran on September 20, 2007 and announced that the first meeting would be held at ILA36 in Orlando, Florida, USA.

Over forty members of the international navigation community from ILA and the governmental, military, academic and commercial sectors met on Monday Oct 15 at ILA36, Embassy Suits Hotel, Orlando, Florida, USA, for the first meeting of SC127 to consider the creation of Standards for eLoran Systems.

RTCM president Robert Markle provided an overview of the history of RTCM in the development of standards. A typical RTCM Committee meets three or four times a year. Committee participants are representatives of the member organizations which support RTCM. In view of pending developments in the future of Loran, both in the USA and Europe, there was a general agreement that standardizations were needed in areas including eLoran systems, signal-in-space, operations and receivers for both the maritime and aviation applications. Mr. Ben Petersen was selected as chairman for future meetings.

In the course of the informal discussions that followed, several opinions were expressed on the future tasks for the standardization group. The signal-in-space needs to be defined on the international level, to apply to both maritime and aviation users and include all aspects of accuracy, availability, continuity and integrity. In addition the signals should provide backward compatibility for legacy users. It was noted at a recent meeting of IALA that the ILA definition document for eLoran should be used. It was felt that eLoran should be regarded as a backup for GNSS for position and navigation and not an augmentation. For timing purposes it is the equal of GNSS. For maritime users the most important issue is accuracy so that differential corrections with respect to an ASF database are most important.

It was decided that members of the committee would work initially on the standards for signal-in-space and maritime receivers. For the next meeting it was agreed that Mr. Peterson would prepare a provisional signal-in-space standard and Mr. Offermans a provisional maritime receiver standard.

The Summary Record of the Committee meeting including a list of attendees is available as RTCM Paper 195-2007-SC127-003 on the RTCM website **www.rtcm.org.** ■

AWARDS

Medal of Merit

Dr. Sally Basker

Dr. Sally Basker, Director of Research and Radio Navigation for the General Lighthouse Authorities (GLAs) of the United Kingdom and Ireland, occupies a key leadership role as the GLAs move from a service based primarily on lighthouses and buoys to one based on radio navigation systems.

Dr. Basker has clearly articulated the case for e-Navigation. She has identified a maritime world of ever larger and faster vessels and increasing congestion, in which mariners on one- or two-man bridges become less able to cope with the loss of their satellite navigation systems. Aware that only enhanced Loran can meet the need for a dissimilar, complementary, multi-modal and independent source of position, navigation and time, she has driven forward eLoran development. Her influence has led to the recent announcement of a fifteen-year contract for the provision of state-of-the-art eLoran radio navigation service to enhance the future safety of mariners in the waters of the UK and Ireland.

In recognition of her outstanding technical and management leadership and understanding of the need for GNSS backup the International Loran Association presents Dr. Basker with its most prestigious award.

Medal of Merit

Capt. William J. Brogdon

Capt Brogdon is cited for his long career in the U.S. Coast Guard and, in retirement, as an advocate for better safety at sea with a strong belief that reliance on a singe source of position information would lead to unsafe navigation.

During his Coast Guard career assignment to Aids to Navigation, he developed a significantly more

accurate method for setting floating aids, greatly reducing the grounding risk for commercial vessels in channels. After retirement from the U.S. Coast Guard, Captain Brogdon wrote for magazines and called for requirements to use multiple electronic navigation systems, pointing out that navigators were losing competence in manual navigation techniques and needed redundant electronic systems to allow for the loss of any one. He spoke regularly for the continuation of Loran service as the most useful and cost effective back up to satellite navigation systems.

In recognition of his outstanding leadership, his commitment to Loran, his understanding of the need for GNSS backup and honoring the memory of his dedicated participation in our work, the International Loran Association presents its most prestigious award.

Presented to Joyce Sidney Brogdon, 17 October 2007.

Medal of Merit

Captain James T. Doherty

Throughout his career in the U.S. Coast Guard, Captain James Doherty was a determined advocate for reasoned and unemotional decision making, particularly as concerned PNT systems. He demonstrated outstanding qualities as Commanding Officer of the USCG Navigation Center, in the management of the Civil GPS Service Interface committee (CGSIC) and the Loran–C Control Center in the face of powerful conflicts between supporters of GPS and supporters of Loran–C.

After his retirement from the USCG, the qualities he displayed led him to become a key member of the Independent Assessment Team (IAT), a Secretary-level group charged with making the final recommendations on the continuation of Loran-C. He ultimately served as Executive Director of IAT. He brought a broad technical knowledge of both systems, an understanding of the technical/ political situation and a keen objective outlook in negotiation to the IAT.

His effective management style, speaking ability and unflagging efforts to bring closure to the Loran–C continuation decision have contributed substantially to the agreement by IAT on a recommendation for the continuation of Loran-C.

In recognition of his outstanding skills in negotiation, analysis and coordination in bringing this very positive recommendation to fruition, the International Loran Association presents Captain Doherty with its most prestigious award.

John M. Beukers Award for Technical Innovation

Dr. Paul R. Johannessen & the Megapulse Team

Dr. Paul Johannessen's conception and the Megapulse team's development of the high-power solid state Loran-C transmitter revolutionized and eventually replaced the vacuum tube in Loran transmitting stations. The impact of lower-cost solid-state technology on the operation and support of Loran-C stations mandated the replacement of all North American transmitters and made it economically feasible for nations in Europe and Asia to establish new Loran-C services.

Dr. Johannessen's innovative talent produced technological breakthroughs of immense significance that made the continued operation of Loran economically possible. The technological advances directly related to his work have provided the basis for the evolution of Loran systems making them compatible with and a viable alternative to satellite navigation constellations, thereby ensuring the longevity of Loran.

President's Award

Dr. David Diggle

Dr. Diggle is recognized for his outstanding contributions to Loran-C, both for his technical efforts to demonstrate acceptable Loran-C performance in aircraft and his efforts to inform the international navigation community of the capabilities of Loran. He has ensured that Ohio University's King Air aircraft was available and equipped with appropriate measurement devices for the FAA Evaluation Team tests and evaluations. He has advocated and participated in high voltage discharge tests and many hours of flight tests, demonstrating that H-field antennas will resolve all major concerns about Loran reception under adverse weather conditions. He has presented test result information in USA and Europe, gaining world-wide acceptance of the potential for the satisfactory use of Loran in aircraft.

In recognition of his knowledgeable, enthusiastic, inspirational and dedicated support of Loran-C and his efforts to establish eLoran as the position, navigation and time backup for the critical infrastructure of the United States, the International Loran Association presents Dr. Diggle with the Presidents Award.

2006 Technical Symposium

Best Paper award

Janet Blazyk, Curtis Cutright, David Diggle and Frank van Grass, Ohio University

Recent Ohio University Loran-C Atmospheric Noise Flight Test Results presented at ILA35, October 2006.

Outstanding Service Awards

Christine Cleary

For her contributions to Loran and the Association as an outstanding Poster Arts Technician for the International Loran Association.

Joanne Guiterrez

For her contributions to Loran and the Association as an outstanding Financial Management Technician for the International Loran Association.

Prof. Peter Swaszek

For his contribution to Loran and the Association as Technical Chair of the International Loran Association 35th Annual Convention and Technical Symposium 2006.

Dr. Gregory Johnson

For his contribution to Loran and the Association as General Chair of the International Loran Association 35th Annual Convention and Technical Symposium 2006.

RTCM SC-127 Working Groups meet in San Diego, CA USA

With the formal recognition by the RTCM Board of Directors of Special Committee 127 on eLoran and the organization and preliminary framework created at the initial meeting in Orlando at ILA-36, the important task of producing standards for eLoran made further progress as members of the committee met in San Diego on 31 January 2008. Opening remarks from Chairman Ben Peterson outlined some of the tasks that lie ahead in crafting MPS documents for eLoran receivers and specifications for the eLoran signal-in-space. His comments are reported in RTCM paper SC 127-0-014. Active working groups were established for Loran Survey data, with Zachary Conover as Chair, and Receiver MPS lead by Gerard Offermans. During the subsequent discussion, a detailed list of Action Items was prepared in an effort to identify issues related to receiver design and eLoran performance that the committee should address and to prepare preliminary task assignments and working groups. These items are currently posted at http://rtcm.info/sec127/RTCMparking_lotmod.xls

A Summary Record for the 31 January 2008 meeting is in preparation and will be distributed together with the attendance list at http://rtcm.info/sc127/membershipREV1.xls

The next meeting for the committee is tentatively scheduled for San Diego, either 5 May 2008 or 9 May 2008. The third session will be at the joint meeting of the Royal Institute of Navigation (RIN) and the International Loran Association NAV08/ILA37 in London, UK in October 2008.

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.

1 se

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.)



101 Billerica Avenue 4 Billerica Business Center North Billerica, MA 01862 ph 978.670.9906 fax 978.670.3776 www.megapulse.com