NAV99/ILA28 was held at Church House in the rotunda (below) used by the Clergy of the Church of England. Church House is situated in the heart of Westminster in the tranquil setting of Dean’s Yard directly across from Westminster Abbey (above) and within walking distance of the Houses of Parliament, Buckingham Palace and Trafalgar Square. The venue is used regularly by the Royal Institute of Navigation for its NAV series of conferences and is an ideal location for conferences of this size.
Jac Spaans leans over to make a comment to Pinky Grocott in the rotunda during one of the sessions.

Members of the European Group of Institutes of Navigation take advantage of the conference to hold a planning meeting.
Dick Smith, President of the RIN, welcomes the ILA and delegates to the conference.

President of the ILA, Linn Roth sets the tone of the conference in his opening remarks.

IALA’s Secretary General Torsten Kruuse provides the Keynote Address.

Standing in for the Chinese delegate, Peter Kent gives an update on FERNS activities.

Ulrich Klinge, Chairman of the NELS Steering Committee, gives a NELS status report.

Vladimir Denisov, Director of the Internavigation Technical Center in Russia, provides the status and prospects of radionavigation in Russia.

and David Broughton, RIN Executive Director, gives last minute administrative details for what turned out to be a well organized and excellent conference.

Plenary Session and Session 1
Session 2A Chair, John Beukers discusses the future of radionavigation.

US Department of Transportation, Heywood Shirer talks about preparing radionavigation systems for the 21st Century.

Becky Caswell of the US Coast Guard describes the Department of Transportation’s radionavigation civil interface role.

Session 2B Chair, Past FAA Administrator, Langhorne Bond highlights the pitfalls in the “Golden Age” of radionavigation.

Jac Spaans, Chairman of the European Group of Institutes of Navigation (EUGiN) describes the group’s role in radionavigation planning.

Terje Jorgensen, Chief of the NELS Coordinating Office, gives a status report on Loran-C/Eurofix activities in Europe.

Ron Davis of Booz Allen & Hamilton discusses his company’s role in conducting Loran-C studies for the US Department of Transportation.

Sessions 2A and 2B

Bill Roland expounds on Loran-C chain and UTC synchronization.

Standing in for Steve O’Neill, Byron Bailey from Boeing briefs the delegates on GPS modernization.

The influence of satellite communication technology on navigation is the subject of Reinhard Müller’s presentation.

John Spiller defines the user and service technical requirements for Galileo.

John Owen describes GNSS-2 design and signal structure.

Galileo system design is covered by Roger Shawyer of Matra Marconi Space.

Jim Jacoby describes the Locus Inc. combined GPS/Loran-C precision timing receiver.

Sessions 3 and 4
Sessions 5 and 6

Session 5: Propagation and Interference
Chairman: Bill Roland

Abbas Mohammed discusses Detection and Minimization of Skywave Interference in Loran-C Receivers.

Phil Benstead discusses the Current and Potential Problems Associated with the Design of GNSS Approach Procedures.

Sessions 5 and 6

Session 6: System Integration
Chairman: Nick Ward

Joe Kunches gives his traditional talk on solar activity predictions.

Durk van Willigen presents his views on Integrated Navigation in Europe, the Far East and the US.

Robert Lilley reports on the performance of Loran-C E-Field and H-Field Antennas.

Paul Williams reports on work to Map the ASFs of the Northwest European Loran-C System.


An Integrated Safety System for the Icelandic Fisheries is presented by H. Einarsson.
Gerard Offermans reports on recent trials implementing Eurofix in Europe and Russia.

Covering for Mitch Narins of the US FAA, Bob Lilley presented the status of the FAA’s Loran-C program.

Nick Ward of the Trinity House Lighthouse Service presented results of trials to determine the NELS Coverage in the UK and Irish Waters.

Land coverage of Radiobeacon DGNSS and the reallocation of Radiobeacon frequencies in Europe were the subjects of two papers presented by David Last.

Bill Roland addressed the transmission of Essential WAAS Data by Eurofix.

GNSS & WGS84 for Marine Navigation was the subject of the paper presented by Terry Moore.

Session 9 – Receiver Technology
Chairman: David Last attending to a temporary digression for David Broughton to announce important last minute administrative details. In case you were wondering, Sid Smith, our Convention Coordinator, appears in all the Session Chair photos as our inimitable timekeeper.

Frank Gustke discusses the results of a study to determine the Market Potential of Hybrid GPS/Loran-C Receivers.

Arthur Helwig presenting a new concept of City Fix: Using Existing MW-Transmitters as Dead-Reckoning Beacons.

Christian Forst’s paper An Integrated Loran-C – GNSS-Eurofix Sensor Combination was presented by co-author M. Maurer.

Paul Schick of Locus Inc. presented a paper covering Improved SNRS and Adaptive Filtering in New DSP-Based Loran-C Receivers.
Vic Strachan gives his paper on Inertial Measurement Technology in the Satellite Navigation.

Use of Terrestrial Augmentation to GNSS in Aviation was the subject of Achim Eckermann’s presentation.

Brita Hafskjold added a new dimension to radionavigation with her paper – Integrated Camera Based Navigation.

Dieter Pade of AOPA Germany addresses Loran-C and the Aviation Community.

Session 10 – Aviation Issues
Chairman: Bob Lilley

Session 11 – General Discussion and Resolution
Chairman: Peter Kent.

Sessions 10 and 11
Medal of Merit: Langhorne Bond

President's Award: Terje H. Jørgensen
Norwegian Defense Communications and Data Services Administration
Delft University of Technology
John M. Beukers
Beukers Technologies

Outstanding Service Awards:

William Roland
General Chair
1998 ILA Convention and Technical Symposium

Robert W. Lilley
Technical Program Co-Chair
1998 ILA Convention and Technical Symposium

David J. Last
Technical Program Co-Chair
1998 ILA Convention and Technical Symposium

Walter N. Dean
For outstanding and continued service to the International Loran Association

Martin C. Poppe
For contributions to Loran and the Association
as Treasurer, Chair of the Awards Committee, and Design Engineer

Larry P. Barnett
For outstanding service in communicating
the need for continued US Loran operations to Congress and the DOT

Dr. Albert D. Frost
For excellence in editing and publishing "Loran Lines,"
the newsletter of the International Loran Association

Otis Philbrick
For excellence in editing and publishing "Loran Lines,"
the newsletter of the International Loran Association

1998 Technical Symposium

Best Paper Award: Dr. Dirk Kügler
"Hybrid GPS/Loran-C Receivers"

Best Student Paper Award:

A.W.S. Helwig, G.W.A. Offermans, and D. van Willigen
Delft University of Technology, The Netherlands
"Eurofix - Description and Results of US-Based Field Trials
Done in a US–European Co-operation"
The International Loran Association
1999 Awards Presentations - 2

Award Citations

**Medal of Merit**

**Langhorne Bond**

*Langhorne Bond has shown courage and tenacity by countering the trend toward “sole-means” navigation. He recognized the safety and economic implications of total dependence upon space born satellite services for positioning, navigation and time dissemination. He has presented numerous papers to forcefully communicate with the international community in order to caution against adopting a policy that is inherently unsafe. His efforts have received international acclaim.*

*As a past Administrator of the United States Federal Aviation Administration, his responsibility for public safety required vigilant attention to the performance and continuous availability of radionavigation services. Mr. Bond’s belief that safety is derived from radionavigation diversity has led to his active on going support of Loran-C as a natural complement to satellite services.*

**President's Awards**

**Terje H. Jørgensen**

*As Head of the Northwest Europe Loran-C System (NELS) Co-ordinating Office Agency, Terje Jørgensen’s indefatigable contribution to the NELS international consortium is recognized by the International Loran Association as significant to the implementation of the Loran-C service in Europe and an important influence on Loran-C policy in other regions of the world.*

*Mr. Jørgensen has championed the use of the Eurofix communication capability of Loran-C transmitters and has actively supported the adoption of wide area augmentation for satellite positioning and navigation services. His efforts culminated in the NELS Steering Committee April 1999 agreement to fund the implementation of Eurofix on four NELS transmitters and the option of expansion to full European coverage.*

*In presenting this Award, The International Loran Association also acknowledges the team working under Terje Jørgensen at the Co-ordinating Agency Office (CAO) and the continuing support of the NELS Nations represented by members of the Steering Committee.*

**Delft University of Technology**

*For the development of Eurofix under the direction of Dr. Durk van Willigen To recognize this significant contribution, The International Loran Association presents Delft University of Technology the 1999 ILA President’s Award.*

**John M. Beukers**

*For many years, John Beukers has been recognized as an authority on radionavigation systems and policies. During that period, he has dedicated extraordinary time and effort to the international radionavigation community, first as an advocate of sound national policies based on safety and the prerequisite requirement of technical diversity, and second, as an advocate of Loran-C as a complement to satellite systems.*

*Through these efforts, John Beukers has significantly contributed to the elevation of national and international discussions beyond single technology and individual country issues, and helped to establish a more reasoned framework for international cooperation in developing and harmonizing radionavigation policies and systems.*
Langhorne Bond has shown courage and tenacity by countering the trend toward “sole-means” navigation. He recognized the safety and economic implications of total dependence upon space born satellite services for positioning, navigation and time dissemination. He has presented numerous papers to forcefully communicate with the international community in order to caution against adopting a policy that is inherently unsafe. His efforts have received international acclaim.

As a past Administrator of the United States Federal Aviation Administration, his responsibility for public safety required vigilant attention to the performance and continuous availability of radionavigation services. Mr. Bond’s belief that safety is derived from radionavigation diversity has led to his active ongoing support of Loran-C as a natural complement to satellite services.

To recognize these significant contributions, The International Loran Association presents The Honorable Langhorne Bond with its most prestigious award, The Medal of Merit.

Presented this 2nd day of November, 1999

Dr. G. Linn Roth, President
International Loran Association
1999 Annual Awards Presentations – 3 (not all recipients shown)

The Best Student Paper Award went to Arthur Helwig and Gerard Offermans for their paper on Eurofix.
Awards Chairman, Marty Poppe stands by.

Outstanding Service Awards were given to (Right to Left): Bill Roland, Al Frost, Walt Dean, Marty Poppe, Bob Lilley and David Last by President Linn Roth.

Langhorne Bond receiving the most prestigious of ILA awards, the Medal of Merit, from President Linn Roth.

Terje Jorgensen received a President’s Award for his work as the Chief of the NELS Co-ordinating Office.

Durk van Willigen accepting a President’s Award on behalf of the Delft University of Technology.
Luncheon and coffee/tea breaks were catered in the exhibition hall adjacent to the Church House rotunda. Here are some casual shots of a few of the delegates absorbed in discussion.

Left to right are Arthur Helwig (Delft University of Technology), Gunn Marit Hernes (NELS), Marty Poppe (Cambridge Engineering), Christian Forst (German Federal Waterways and Shipping Administration) and Gerard Offermans (Reelectronika). Could this be a discussion on the NELS Loran-C/Eurofix implementation?

Marty Poppe (Cambridge Engineering) talking to Millie Rott (Boeing). Thank you for arranging Boeing’s sponsorship of the banquet, Millie, and all the best for your retirement.

Heywood Shirer (US Dept. of Transportation) perhaps being pressed for a date for publication of the 1998 FRP by Erik Johannessen (Megapulse) and Bob Lilley (Illgen Simulation Technologies)?

John Beukers (Beukers Technologies) having an intense Eurofix discussion with its developer Professor Durk van Willigen. “It really works, Durk!”
Ulrich Klinge, Chairman of the NELS Steering Committee, chatting with Durk van Willigen. “Ah! So that’s how it works, Durk!”

Andreas Stenseth (Deputy Director General of the Norwegian Defence Communications and Data Services Administration - NODECA) listening intently to Inger-Lise Sogstad (Adviser to the Norwegian Ministry of Fisheries).

Paul Schick (Locus) at the Racal exhibition stand with Reinhard Müller (University of Wismar) - obviously finding something of interest.
Church House Exhibition Hall
Lunch and Coffee Breaks - 3

Heywood Shirer (US Department of Transportation) enjoying an exchange of views with Curt Dubay and Chuck Shue, both of the United States Coast Guard.

Paul Johannessen (Megapulse and father of the solid state Loran-C transmitter) sharing some thoughts with Marty Poppe (Cambridge Engineering)

Wally Blanchard (Past President of the RIN and one of the original Decca team) most likely passing on some of his wide experience to H. Einarsson (Racal Tracs).
The RIN – ILA Banquet -1

The customary formal ILA Banquet held during the course of its Annual Convention was enhanced this year by RIN delegates and their partners. It was held in the historic Victoria Station hotel and sponsored by the Boeing Corporation.

RIN President Dick Smith, with microphone in hand, responds to a gift in the form of a plaque being held by ILA President Linn Roth.

Millie Rott and Byron Baily, both of the Boeing Corporation. Our gratitude to the company for its sponsorship.

Chuck Schue of the US Coast Guard Loran Support Unit explaining the finer details of the Loran-C system to an attentive past FAA Administrator, Langhorne Bond.

Vladimir Denisov from the Internavigation Technical Center with interpreter talking to Peter Kent and Paul Ridgway. The subject matter must be FERNS or IALA business.
Marilyn Beukers reading the President’s Award Citation before being presented to John Beukers.

Our banquet speaker from the English Heritage, Stephen Brindle, gave an eloquent and quite long talk on the fire and restoration of Windsor Castle. Thrown in was a history of the railroads of Great Britain and the hotels that accommodated the weary travelers. The Victoria hotel (now Thistle) was one of the hotels whose architecture was described by Stephen.

A previous Medal of Merit winner and former Secretary General of IALA – Norman Matthews and his wife Mary.
Ellen Grove of the NELS CAO chatting with NODECA Director Andreas Stenseth. Bahar Utham and partner in the background.

An alert David Last talking to an old timer Walt Dean, both of who are former Medal of Merit recipients. And a huge thank you Walt for taking all these splendid photographs.

A marine table: Christian Forst from the German Waterways Administration and Nick Ward of the Trinity House Lighthouse Service.
The International Loran Association holding the first of its two Board of Directors meetings. Elected Directors are installed and Officers are appointed during the Convention following which a second Board meeting is held.

To follow tradition, the ILA suggested that the RIN join in sponsoring a hospitality suite during the Convention. Open after hours our photographer caught Captain Bill Brogdon and his wife Joyce enjoying the relaxing atmosphere.

ILA Secretary and photographer Walt Dean and his wife Shirley

Directors John Beukers, Bob Lilley and Langhorne Bond, frequently known as being amongst “The Usual Suspects” (for loran advocacy).
Monitoring Site Open House
Longborough, Moreton-in-Marsh
Gloucestershire, UK

Following the Conference, delegates and their partners were invited to visit a radionavigation monitoring site operated by John Beukers at his home located in the Cotswolds some 90 miles northwest of London. Twenty-four brave souls ventured forth, some by train, others by car.

On view were live monitors showing the performance of GPS; differential GPS using a local radiobeacon for the transmission of GPS corrections; differential GPS using the Eurofix data channel on the Sylt, Germany Loran-C transmitter; and Loran-C derived from the most recent Locus Inc. receiver.

A poster display of performance of these various radionavigation systems over the past several months showed the comparative accuracy that was being obtained at the site.

To greet the delegates present and to demonstrate the capability of the Eurofix concept, a message was sent from the Sylt transmitter that appeared on the Eurofix receiver monitor.

After an enjoyable luncheon and a quick look at the countryside, the visitors went their various ways for extended stays in the UK or just back home.

Roof mounted antenna complex contained within a 1 meter diameter:
From left to right – Megapulse Eurofix H-Field loop; Locus E-Field Loran-C whip; CSI combined GPS and Beacon for Beacon DGPS; GPS for uncorrected GPS; GPS for Eurofix DGPS.