



Directors' Newsletter

From the Secretary

January 1, 1990

New Year Ramblings

By John Beukers

Happy New Year! Best wishes for a prosperous 1990.

As we step Boldly into the 90's we should pause for a moment to reflect upon the progress made by the loran industry and its users during the 80's. While the 70's could be characterized by commitment to Loran-C, the 80's showed the system's true colors. It literally took off into the air and landed on its feet with a broad range of terrestrial applications being implemented. Lower receiver costs brought about by advances in microelectronic technology certainly had much to do with the system's popularity. We should not forget, however, that without Loran-C's inherent accuracy and its high benefit-to-cost ratio, the unprecedented growth of this radionavigation system would not have materialized.

The 80's also saw the Global Positioning System finally getting off the ground and, perhaps more importantly, being brought into perspective with other radionavigation systems. GPS's hard sell was replaced with a modicum of reality suggesting that, perhaps after all, GPS was not all things to all men (and women). The expression "Sole Means" took on added meaning and the word "Interoperability" entered into radionavigation jargon.

International adoption of Loran-C can also be assigned to the 80's. The Middle East, China and France already have operational transmitters on national soil. The approval of appropriations in India and Venezuela and the near approval for NW Europe for additional national transmitters are further indications of international acceptance of loran. Plans for host countries to take title and operate U.S. Loran-C transmitters will also go down as achievements of the 80's.

The 90's will surely be an exciting
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U. K. Issues Rebuttal

The United Kingdom Department of Transportation responds to Racal-Decca.

Just before the holidays, the Marine Directorate of the U.K. DOT issued a point by point rebuttal to the points raised by Racal-Decca in the company's comments on the DOT Consultative Document. In the accompanying letter to Racal-Decca, Michael Jackson of the Marine Directorate makes the point that since Racal-Decca's comments were "made available to a wide audience", the department was making a wide distribution of the department's response.

Since this issue is pivotal to the acceptance of loran in Europe and possibly other areas, the letter is reproduced below. Take

particular note of the additional opportunity to make further comments until the end of January. Copies of the DOT response are available from the Secretary.

It should be noted that the support for loran in Europe runs high. Norm Matthews, Director General of IALA, tells us that he will be making a television appearance in the UK in early January to help publicize the issue. We understand that the UK Meteorological Office jumped in because of their past, present and future commitment to use loran for tracking atmospheric probes.

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Department of Transport
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12 December 1989

Dear Mr. Trubee,

FUTURE OF MARINE RADIONAVIGATION IN UK WATERS

We are now in a position to respond to the points which you raised on the Department's Consultative Document in your letter of 11 August and I attach our detailed comments on yours.

We regret that we have not been afforded an opportunity of continuing the discussion with you on the points you raised in your letter which we started at our meeting on the 29 September and which you decided to terminate. We stand ready to resume that discussion when you are prepared to do so.

We do not believe that the conclusions which you set out in your letter are well founded. We consider that sufficient time has been allowed to produce the ASF corrections and that our costings include realistic provision for this. Similarly we believe that we have made a realistic assessment of the performance and accuracy of the two systems under consideration; and that well-understood means are available for dealing with interference to Loran C transmissions.

We remain to be convinced that we have not allowed a sufficient overlap for the two systems, given the notice of the changeover which we would be able to give. And we believe that the basis which you have adopted for assessing the costs of replace-

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U.K.

Continued from page 1

ment equipment which would fall on the users in the event of a changeover is unrealistic and greatly overstates the real cost of premature receiver replacements.

We consider that the cost arguments in favour of Loran C are generally stronger than you are prepared to concede. We are however keeping the relative costs of the two systems under review.

I should conclude by emphasising that no decision has yet been taken on whether to retain the Decca Navigator system or to change over to Loran C.

Since I believe that your comments on the Consultative Document have been made available to a wide audience, I am circulating our own comments to all those from whom we originally sought comments on our Consultative Document, together with the other bodies who have subsequently commented on it. We should be grateful for any further comments which they may wish to make. It would be helpful if we could have any further such comments by the end of January.

Yours sincerely,
(signed) Michael Jackson

Loran Calibrates Wind Profiler

by James F. Morrissey

(The following is excerpted from a presentation sent in by Jim Morrissey of the Geophysics Laboratory, Hanscom Air Force Base in Massachusetts.)

The introduction of wind profiling radars over the past several years has provided a new technique for a wide variety of applications requiring wind measurements. One of these applications is at missile ranges to provide data for missile launches. To determine whether the accuracy of the profiler is adequate for the application, a series of comparisons are to be made with winds determined by loran-type radiosondes.

The radiosonde uses retransmitted loran signals to give a position time history of a rising balloon which is differentiated to provide velocity. Winds will be computed based on one minute of data which represents an atmospheric resolution of 200 meters but will be updated every 6 seconds or 20 meters. The ex-

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FRP Receives WGA Input

Directors' and Members' comments are transmitted to the DOT Working Group.

Telephone, faxes and modems were busy over the holidays receiving and exchanging material to be consolidated into a unified document responding to the request for input to the 1990 Federal Radionavigation Plan. The WGA response was finalized on December 29th and mailed to Washington, meeting the deadline. Our genuine thanks to all who contributed, especially our President, Jim Culbertson, who did much of the spade work.

The amount of work that goes into an effort like this should not go unnoticed. A couple of points are worth noting: the time saved by the use of modems to exchange files cannot be overstated, and secondly the FRP is a monumental task for the DOT Working Group who need all the assistance that it can get. The WGA can and should do more to make the 1990 FRP a better planning document - we need to hear from more of the Directors and members!

A copy of the material presented is available from the Secretary along with the cover letter sent to the Chairman of the Working Group.

Ramblings

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and challenging period for radionavigation and radio positioning services. There is no reason to disbelieve the forecast so well presented by Bill Polhemus in his paper "Assessment of Benefits" which projects a ten fold increase in use of these radio signals on land, at sea and in the air during the decade.

And where will the WGA be? We trust up front - ready and willing to assist, nationally and internationally, by providing technical input and professional guidance through its membership.

WGA Board to Meet in San Diego

The next WGA Board of Directors' Meeting is to be held during the National Technical Meeting of the Institute of Navigation in San Diego. The meeting is scheduled for 1.00 p.m. on January 25th, 1990, at the Princess Resort in a room that will be announced during the ION meeting. If you are unable to attend, please send your proxy to the Secretary to arrive no later than Friday, January 19th or have it hand carried by your delegate. The meeting agenda, reports and minutes of the previous Board Meeting will be mailed to Directors on Friday, January 12th, 1990.

ION Meeting Includes Loran-C Session

Mike Moroney to Chair Session III - Loran-C in Civil Aviation.

The National Technical Meeting of the Institute of Navigation will include a Loran-C session in a well rounded agenda. Papers to be presented under the Chairmanship of Director Mike Moroney are listed below:

Loran System Expansion for Aviation	CDR. G.T. Gunther, USCG
Predicted Solar Flare Activities for the 1990's	Joseph M. Kunches, NOAA
The FAA Gears Up for Loran	John S. Kern, FAA
NASAO Initiatives for Loran Aviation	Michael J Ferguson, NASAO
Loran-C Nonprecision Approaches-Fact or Fiction?	Donald D. Engen, AOPA
Loran/GPS Interoperability	Video Report

The session is to be held on Tuesday, January 23rd, 1990 at 1.30 p.m. in the Princess Resort, San Diego, CA.

Sessions on International Navigation Initiatives, GPS, Omega and VLF, and Inertial Navigation are included in the Program.

Wind Profiler

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pected accuracy of this system in the Sudbury area is better than 0.5 meters/second (1 Knot).

The measurements will be performed over a one year period and entail both day and nighttime testing. Four types of tests are planned. (1) A series of balloon releases at a missile range where a single loran radiosonde will be tracked by two loran receiving stations and by an FPS-16 radar. (2) A group of four sondes released in 1/2 hr. time increments. (3) Release of two sondes on one balloon. (4) The release of two sondes on two balloons at the same time.

Data from these tests are expected to establish the accuracy and characteristics of the new wind profiler technique.

West-Mediterranean Help Needed

Customers of loran receivers request coverage information.

We have been asked to supply information on the Loran-C coverage in the West Mediterranean, especially in waters bordering Turkey. There is also a request for availability of dual chain receivers to extend coverage into this area of the world. If anyone is able to supply information, please contact the Secretary.

Appreciation from Mike Eaton

In a letter addressed to Past President John Illgen, Mike Eaton writes that he received his certificate of Honorary Membership from Gerard Lachapelle and expresses his appreciation.

"I want to thank you, and through you, the WGA, for this very gratifying award. I appreciate your recognition a great deal."

Mike adds that although he has been retired for 18 months he "...still takes any opportunity to contribute to the cause of loran, GPS or any other useful advance in Navigation."

U.S. - Soviet Loran-C

Soviets provide details of joint U.S. Loran-C and Chayka radionavigation system.

At the 1989 WGA Convention held in Hyannis, the Soviet delegation provided the WGA with a published booklet entitled "Establishment of Soviet-U.S. Chain of Chayka- Loran-C Radionavigation System - Related Documents". The delegation indicated that we could quote from this publication so long as we gave credit to the source of the material. It should be noted that the Related Documents are designated as being "Drafts".

The booklet has a publication date of 1989 and gives a substantial amount of technical information of the joint operation and of the Soviet system including a 4 color coverage diagram of the combined systems. The preface is quoted verbatim below since it provides an excellent summary of the contents. While there is no table of contents, a list of the sections and subsections is reproduced for the reader's interest.

The present documents have been prepared in accordance with the Agreement between the Government of the Union of Soviet Socialist Republics and the Government of the United States of America on the establishment of a joint Chayka and Loran-C radionavigation system. These cover the Soviet Party proposals on working out the documents specified in Article IV of the Agreement.

The draft of the tactical-and-technical assignment for developing the Soviet/U.S. chain includes the main tactical-and-technical requirements for the joint chain deemed necessary by the Soviet users. Should these requirements prove unacceptable for the U.S. users of the navigation system, the Soviet Party will consider pertinent suggestions on the issues.

The document "Main technical problems to arise in establishing Soviet/U.S. chain" is intended to introduce the U.S. Party to the problems the Soviet experts are tackling. Also included is a number of Soviet proposals on joint investigations concerning the establishment of the Soviet/U.S. chain.

The document "Brief description of ground station" introduces the U.S. experts to the Soviet station operation. A similar document describing the U.S. station operation will be helpful for the

Soviet experts in tackling the problems of the station lock-on in the Soviet/U.S. chain.

The draft of the program and method of experimental works in establishing joint Soviet/U.S. chain comprises Soviet suggestions on carrying out works involving the selection of the Soviet station signal shapes to be used in the joint chain.

The draft "Manual of the establishment of Soviet/U.S. chain of Chayka/ Loran-C radionavigation system" should be looked upon as Soviet efforts in working out a united document specifying the radionavigation system to come, coordinating the scientific and technical principles, methods, and approaches the Parties will be using in establishing the Soviet/U.S. chain.

The next document contains the Soviet suggestions on the preparation of the "Manual of control, monitoring, and operation of Soviet/U.S. chain of Chayka/ Loran-C radionavigation system".

The last document covers the Soviet suggestions on providing an information service available to all navigation users, regarding the status and availability of the Soviet/U.S. chain.

All the pertinent suggestions of the U.S. Party on said documents will be given due attention and discussion."

A. Tactical and Technical Assignment for Research and Development Work. "Development of Joint Soviet/U.S. Ground Station Chain of Chayka/ Loran-C Radionavigation System. Code "Concord"

1. Research and Development Work Name and Cause for Conducting Same.
2. Purpose.
3. Composition of Joint Soviet/U.S. Chain.
4. Radionavigation Chain Tactical and Technical Requirements.
5. R & D Work Phases.
6. R & D Work Phase Carrying Out and Acceptance.
7. Terms of Putting the Joint Chain to Tests.

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U.S.-Soviet

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B. Main Technical Problems to Arise in Establishing Soviet/U.S. Chain.

1. Selecting Signal Shape for Chayka System.
2. Joint Soviet/U.S. Chain Ground Station Lock-On.
3. Navigation Channel Service Data Exchange.
4. Determining Joint Chain Coverage.
5. Brief Description of Ground Station.

C. Program and Method of Experimental Works in Establishing Joint Soviet/U.S. Chain of Chayka/Loran-C Radionavigation System.

1. Objects to be Tested.
2. Test Purpose.
3. General.
4. Volume of Tests.
5. Conditions and Procedures of Tests.
6. Material Logistics of Tests.
7. Metrological Support.
8. Keeping Records.
9. Test Procedure.

D. Manual of the Establishment of Soviet/U.S. Chain of Chayka/Loran-C Radionavigation System.

Report 1. Program and Method of Joint Investigations in the Predicted Coverage Area for the Soviet/U.S. Chain with the View of Implementing Its Potential Accuracy.

Report 2. Description of the Radiated Radio Pulse Shape and Method for Maintaining Same.

Report 3. Methods for Monitoring Radiated Signal Parameters.

Report 4. Ground Station Radiation Lock-On Method.

Report 5. Method for Testing Chayka and Loran-C Receivers for the Serviceability from Signals of Ground Stations of Soviet/U.S. Chain.

Report 6. Method for Checking Conditions of Mutual Signal Reception of Stations at Petropavlovsk and Attu, Matching Receiver-Meter Parameters.

E. Main Characteristics of Soviet/U.S. Chain.

F. Manual of Control, Monitoring, and Operation of Soviet/U.S. Chain of Chayka/Loran-C Radionavigation System.

Report 7. Methods for Monitoring Lock-On Parameters and Introducing Corrections for Ground Station Radiation Moments.

Report 8. Procedure for Notifying of Non-Synchronous Ground Station Operation.

Report 9. Data Exchange Procedure for Operators of Soviet and U.S. Stations.

Report 10. Procedure of Exchange Data on Station Performance.

G. Joint Soviet/U.S. Chayka/Loran-C Radionavigation System.

1. Purpose.
2. Composition.
3. Principle of Operation
4. System Coverage Area.
5. Main Characteristics of Chain.
6. Mutual Obligations of Parties and Their Responsibilities in Maintaining Characteristics of Chain.
7. Discussing Issues.
8. Releasing Joint Technological Bulletins on Parameters of Ground and Onboard Equipment.

Finally there is a note at the end of the booklet which states:

"All technical enquiries please refer to the Leningrad Scientific and Research Radio Engineering Institute, Rastrelly Square, 2, Leningrad, USSR 193124. Phone 274-18-94"

Obituary

Pealer, Nevin Anthony (Tony)
Commander, U.S. Coast Guard Ret.

It is with sadness that we have to report the death of WGA member Tony Pealer, U.S. Coast Guard (Ret.).

Tony was a loran enthusiast and an outstanding contributor to "fostering the art of loran". As Chief of the loran branch G-NRN-1, and as Deputy Chief of the Navigation Division, his colleagues speak of him as a man of vision, a dedicated worker and a good friend. While assigned to the Research and Special Projects Administration of the U.S. Department of Transportation, he was a vocal spokesman for the Federal Radionavigation Plan.

Tony's death is a loss to the loran community and he will be missed by his colleagues. Our condolences to his family and friends.

Membership Continues to Increase

Membership

Here are the membership statistics as of January 1, 1990 for paid up members for 1989 or beyond:

	May 26	July 26	Sept. 26	Nov. 27	Jan.1
Individual	320	346	372	415	426
Corporate1	5	5	5	5	5
Corporate2	11	12	12	12	12
Associate	5	5	5	8	8
Sponsored	93	93	102	102	102
Life	24	24	24	24	24
Honorary	9	10	10	10	10
Prospects	N/A	421	596	771	817
Complimentary	41	41	41	41	41

The total paid up membership, including Life and Honorary members, currently stands at 587 with 817 prospects listed. Membership dues notice for 1990 will be mailed during January. We are hopeful that, with the new system for renewals in place, members will respond in a timely manner.

Loran-C to Support Project STORM

The most comprehensive National Weather Observing Program needs the Mid-Continent Chain for success.

By Gary Skaggs

(At the recent WGA Convention we approached Gary to provide details of the project STORM. Readers should find this article interesting for its dependence upon Loran and also for the work being done by numerous groups to help understand our environment. Ed.)

The National Storm Operational and Research Meteorology (STORM) Program, is a multi-year program of both operations and research. The following statements from the National STORM program plan constitute the core of the plan and express the conviction that mesoscale (small scale) weather processes are both comprehensible and predictable. STORM seeks to: advance fundamental understanding of precipitation and other mesoscale processes and their role in the hydrologic cycle, and improve the 0- to 48-hour prediction of precipitation and severe weather.

During the decade of the '90s, observation of the atmosphere will take a giant leap forward in technology as compared with the recent past. Some of the systems coming on line in the next decade include:

NEXRAD - the NEXt-generation weather RADar system. A Doppler radar system that will provide a multitude of intensity, velocity, and hydrologic data sets for operations and research.

TDWRS - the Terminal Doppler Weather Radar System that will be used at airports around the country to provide a greater degree of safety for air travelers from weather hazards.

ASOS - the Automated Surface Observing System that will automatically give observations from a larger number of surface sites across the nation.

EOS - NASA's Earth Observing System. An advanced series of geostationary and polar orbiting meteorological satellites.

AWIPS - the Advanced Weather Information Processing System of the National Weather Service (NWS) that will provide the computing horsepower needed to assimilate all this new data.

The National Severe Storms Laboratory (NSSL) is one of the several Environmental Research Laboratories (ERL) that make up the research arm of the National

Oceanic and Atmospheric Administration (NOAA). [Author's note: I enjoy explaining who we are; the lineage DOC/NOAA/OAR/ERL/NSSL is a conversational piece in itself!] NSSL developed the forerunner for NEXRAD and is active in the development of computer programs to make NEXRAD live up to its capability. In addition, some of our on-going programs include the study of storm electricity and related processes, hail storms, tornadic thunderstorms, Mesoscale Convective Systems and Complexes, heavy rain producing systems, and the environments that lead to each. These all fit within the structure of STORM, but how does Loran-C fit into our operations?

Loran-C is not new to meteorology. John Beukers developed a system of position finding using Loran-C for meteorological balloons as early as the mid-1960s. This type of system uses re-transmitted Loran-C to find location, therefore wind speed and direction, rather than the elevation and bearing calculations of a radio theodolite system. The system that we use here at NSSL was developed by Vin Lally and Claude Morel, among others, at NCAR (National Center for Atmospheric Research). Our version of the system is called M-CLASS, or Mobile Cross-chain Atmospheric Sounding System. Both NCAR and we use modified Vaisala RSL80 Sondes that include a more sensitive Loran-C receiver in addition to the standard sonde electronics that measure pressure, temperature and humidity. The more sensitive Loran-C receiver that we use is needed because of the weakness of the Loran-C signal in our prime area of research, the Great Plains. The receiver/navigator that we use is the Advanced Navigation, Inc. ANI-7000. Information from the ANI-7000 is sent through its own RS-232 port to an HP-9000 series microcomputer where it is processed and displayed. Future versions of this system will use 80286 type computers. Our M-CLASS system and numerous other meteorological research sensors are contained in a heavily modified 15 passenger van. We have used this system successfully from Florida through the South and Midwest into Arizona and California and

have just recently ordered 3 more class systems from NCAR.

It is very hard to characterize a "typical" day with the crew that does these soundings. Some are done stationary, and others are done "on the run" while chasing convective systems. Our system gives us the freedom to make a launch (which generally takes about 10 minutes from decision to launch) and then, while the sounding is in progress, begin to drive towards another release site. These soundings return data on temperature, humidity, pressure, wind speed and wind direction for immediate operational use and saved for research. Some soundings also include instruments that measure electric fields in the environment around the balloon. The wind speed and direction is derived from Loran-C positioning information. NSSL will be operating at least 3 of these systems during STORM and preliminary plans call for as many as 40 sites, either fixed, portable, or mobile to use CLASS during STORM.

It can readily be seen that, at least from the STORM perspective, the Mid-Continent Chain is not just important, but critical and urgent. Even though the increased sensitivity of the NCAR modified sondes makes Loran-C useful in many situations, it does not increase its accuracy. The Mid-Continent Chain is necessary to have high quality wind data to meet STORM objectives. In addition, NSSL will be taking comparative soundings during the coming years that will be used to evaluate the NWS's new Wind Profiler Network. This is a radar system designed to make upper air soundings of the atmosphere more frequently than the twice daily of the current network. The evaluation of the western Great Plains prototype network is scheduled to begin in the spring of 1991. Loran-C stations in Dana, Indiana, Raymondville, Texas, and Searchlight, Nevada are far from the High Plains of western Kansas. For this reason, Boise City and the Mid-Continent Chain are critical.

This is, very briefly, how Loran-C will fit into STORM. If you have any more questions, feel free to call, write, or E mail me. NSSL is open from 8-5 weekdays. If you're in central Oklahoma, stop by and visit with us. Gary Skaggs, National Severe Storms Laboratory, 1313 Halley Circle, Norman, OK 73160. Phone: (405) 366-0492 (comm) or 736-3492 (fts) Fax: (405) 231-5166 (comm) or 736-5166 (fts) Internet: skaggs@nssl.gcn.uoknor.edu

Notes from RSPA and the IOA Board Meetings

by Dave Olsen

I joined the Research and Special Projects Administration (RSPA) in May 1989, filling the Coast Guard billet vacated by the retirement of CDR Larry Grant. I became actively involved in the International Omega Association, attending their monthly Board of Directors' meetings which are often conveniently held here in the DOT Nassif building. Since I was planning on attending the 1989 WGA convention, IOA President Charlie Sakran asked if I'd represent the IOA at the WGA board meetings (you may have noticed the IOA lapel pin I was wearing!) Shortly after Cape Cod, Jim Culbertson asked if I'd reciprocate and represent WGA at the IOA board meetings. Hence the "double agent" label which Jim applied to me in the 12/1/89 Directors' Newsletter.

Heywood Shirer joined the RSPA radionavigation staff (we're now back to our full strength of two!) on December 18. Heywood came from the Omega Navigation Systems Center (ONSCEN), filling the vacancy left when Dave Scull retired in October. Before leaving ONSCEN, Heywood had volunteered to write an Omega column for the Goose Gazette. Heywood will continue his column, providing a somewhat different perspective to the general membership than I will present to the Board of Directors.

The IOA Board met on November 2 at DOT and on December 7 at the Historical Electronics Museum near the Baltimore Airport. The latter visit was hosted by Mr. Warren Cooper, editor of the IEEE AES (Aerospace and Electronic Systems) Magazine. (Warren has become a benefactor to both the IOA and the WGA, offering us gratis column space and promotional opportunities. Heywood prepared an Omega article for the November issue, and John Illgen an article on WGA for the December issue.)

Membership IOA has approximately 150 regular members, 115 organizational members (from 15 organizations) and 70 life members.

Aviation Requirements for Omega IOA wrote to the FAA Administrator asking for support of the Coast Guard's request for a statement of aviation requirements for Omega. 10/12/89 reply

describes draft FAA/USCG Memorandum of Agreement outlining roles for Omega use in the National Airspace System; efforts to develop a National Aviation Standard for Omega, and the desire to establish a 10-15 year period for Omega phase-out that would not commence until the FAA judges GPS to be an operational system for use in civil aviation.

ION National Technical Meeting: Board was encouraged by willingness of the ION to include a session on Omega and VLF Systems at their January 1990 meeting in San Diego.

Annual Meeting: About 60 attended the October 89 meeting aboard the Hotel Queen Mary in Long Beach. Five-day technical program was mixed with a field trip to the McDonnell Douglas assembly plant and an evening harbor cruise aboard a historic schooner. Hosted reception at the Los Angeles Maritime Museum was outstanding. Arrangements are firming up for the 1990 meeting. Original destination was Singapore, but an offer from Garuda Airline intrigued the Board of Directors. Rooms have been reserved for the week of September 24-29 at Hotel Sanur Beach near Denpasar, Indonesia on the island of Bali! This is the week following the ION GPS-90 meeting in Colorado Springs.

Typing Assistance Requested

A goal for making the loran bibliography more useful is to include an abstract for each paper. The abstracts will then be published along with the listing of authors and paper titles. This involves a substantial amount of typing. It would be greatly appreciated if someone could volunteer some hours to input the abstracts into a word processor and output them as an ASCII text file. Please contact the Secretary.

Please direct all your comments and answers to requests in this Newsletter to:

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Theme for 1990 Convention

by Jim Alexander

One of the prime objectives of the 1990 Convention will be to bring loran to the thousands of users and to get the WGA some exposure to the public. We have had several suggestions for a theme that are consistent with this objective. We have tentatively settled on:

"Loran-C - Its Place in Global Radionavigation. With User Seminars and Workshops."

It is proposed that the Seminars and Workshops are open to the public. Every effort will be made to get substantial support from manufacturers to display their equipment and for them to take active participation in the seminars and workshops. We are also looking for support from the local Coast Guard to provide speakers and perhaps give demonstrations. In addition we are anticipating the Notice to Mariners to be a vehicle to publicize the Convention and its theme.

Newsletter Publication Deadlines

The Directors' Newsletter is issued on the first of the month except the month following the month in which a Board meeting is held. The closing date for material to be included is the 26th day of the preceeding month.

Closing Date	Issue Date
1990	
January	Board Meeting
February 26	March 1
March 26	April 1
April	Board Meeting
May 26	June 1
June 26	July 1
July	Board Meeting
August 26	September 1
September 26	October 1
October	Board Meeting
November 26	December 1
December 26	January 1 (91)