



Directors'

Newsletter

From the Secretary

June 1, 1989

What's Going On!

A couple of us were chatting about running the Association and how we could become more effective. It became apparent that one of the main obstacles is communication to busy people. As volunteers, we do our thing without, perhaps, the recognition that others would like to know how and what we are doing. The infrequent and short board meetings do not offer the sort of relaxed forum for informal discussion and the opportunity at the convention comes but once a year. The *Directors' Newsletter* can perform a useful function for the dissemination of information to Board Members and Committee Chairmen. As a minimum it will provide a vehicle for the secretary to inform those with Association responsibilities of what is happening at the secretary's office.

The *Directors' Newsletter* will be prepared and published each month that there is no board meeting. It will be sent to Directors, Committee Chairmen and others with responsibilities that have a need to know *What's Going On!*

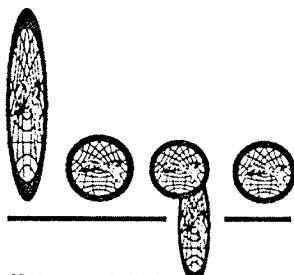
This is your opportunity to pass on those bits of news, actions and requests that others would like to hear about.

Media Questionnaire Yields Results

We have generated an extensive media database which has been exercised a couple of times for promotion of the 1989 Convention. The good news is that the WGA is becoming known and a number of periodicals are carrying our message. The somewhat surprising result of a 350 piece mailing was the number of returned letters, due almost entirely to changes of ownership or address. To improve the situation and based upon a sample provided by Ron Wiener, a questionnaire was prepared requesting

updated information and the relevance of the periodical to the WGA. The response has been excellent and we now know which periodicals will carry WGA releases, those responsible for the material and the lead time for publication.

While the Marine and Air applications are well covered, we are weak in our exposure to the landbased, vehicular arena. *This is a request* - please send a copy of the business page of any publication that is pertinent to the landbased use of loran to John Beukers.



Take one Wild Goose, enlarge it, scan it, and trace it. Pepper it with hyperbolae and circle it with a black border. Scatter some letters around the perimeter, and *Voila* we have a Wild Goose Logo in EPS format ready to go.

It takes a bit of work but the return on the investment in time is substantial. The electronic vector representation is called an Encapsulated Postscript File (known as EPS format) which can be pasted into documents at will. Further, the size and shape of this graphic image can be changed with the "Click of the Mouse", as you can see from the caption to this paragraph. This file is available for use by anyone requesting it. The Geese flying to the board meeting is one component of the logo, sized and replicated.

While on the subject of the WGA logo, research into the logo originally used does not yield a definitive answer to the correct design. Are the hyperbolic lines white or black? As a practical matter, people using letter head paper often copy it with text to be distributed. The blue background with

black lines does not copy well. To overcome this we are trying a logo with a screened blue background and black lines that will look good in color and will copy well in black and white. The logo on the masthead of this newsletter is an example of a screened background that makes a good copy.

Bibliography Nears Completion

It has taken a lot of time and the efforts of a dedicated team to get a bibliography of the WGA publications into a form suitable for publication. To do this it has been necessary to get missing file copies of papers and publications. Our thanks to Bob Frank, Jim Van Etten, Leo Fehlner and Bob Lilley for supplying many of these documents. An appeal is going out in the next Goose Gazette for the remaining papers that have so far remained illusive.

Our thanks also to the folks at TSC. Through the efforts of Ian McWilliams, and with the permission from George Quinn at the FAA, we now have a copy of the TSC bibliography up and running. Also our thanks to John Illgen for providing a copy of the Illgen Simulation Technologies' navigation listings which is being incorporated into the WGA loran bibliography. In addition to this we have obtained the two NTIS indexes on loran references.

Still missing is information on the loran library that was maintained by the Air Force and another loran library that was prepared by Alburn in 1972. This is a collection of 679 titles of R&D reports on Loran-A, -B, -C, -D, and -F compiled by Technology Inc. for the U.S. Air Force. Phone calls to Kim Rogers at Technology Inc., now part of Krug International, have been unsuccessful in surfacing this list.

(Continued on back page)

Letter from the President

Important Notes for the Next Board Meeting

by John Illgen

Board to Meet June 29th.

The WGA Board of Directors will meet on Thursday, June 29, 1989, at 1:00 p.m. in the Ramada Hotel, Old Town, 901 N. Fairfax Street, Alexandria, VA 22314, phone 703-683-6000. *Please check at the hotel desk for the meeting room location.*

Upon receiving this Directors' Newsletter, please prepare your committee reports, if you have not yet done so, and send them to me at Illgen Simulation Technologies, Inc., 351 So. Hitchcock Way, Suite B230, Santa Barbara, CA 93105. I would like to mail all of these reports to each board member in advance of the meeting. This will permit the review of various committee reports in advance of

Have your report to me no later than June 9th.

the meeting. This review will expedite the approval of committee reports at the board meeting and will reduce the length of these meetings and/or permit our time to be better focused. *Please* expedite the preparation of your report(s) and telefax to 805-563-2191 or express mail or use the WGA electronic mail system. Have your report to me no later than June 9, 1989.

When you receive the "Agenda for the 87th WGA Board of Directors' Meeting", please note the time allocated for your committee(s) and/or topics. If any one has any questions regarding the above items, please call me at 805-563-0665 (Office) or 805-685-8809 (Home).

WGA Matters of Interest

* Walt Dean and I have completed the selection of papers for a WGA Loran-C session at Oceans 89.

* There appears to be considerable support by WGA members at the ION Annual Technical Meeting. (See separate article, Ed.)

* I have received very negative replies from the Hawaiian Congressman

regarding the phase out of the Loran-C Hawaiian Chain in the 90's. Will mail letter from Congressman with the Board Meeting Agenda.

* A mixed letter was received from the U.S. Navy through Congressman Lagomarsino's office on the Navy's continued use of Loran-C. However, the Navy takes no credit for the HNS (Hyperfix Navigation System). The Navy indicated Japan sponsors and funds HNS and the U.S. Navy uses it along with the GPS and Loran-C. These letters will be mailed to you with the Board Meeting Agenda.

* The following sections for the WGA DoD Working Group Report have been received and edited.

- Summary mix (Loran-C, GPS, Omega, INS, DME, Doppler, VOR, Tacan)
- DoD/DoT Interaction and Understanding of Requirements.
 - Requirements-Users
 - Cost-GAO
- Single System Problems
 - DoD Survivability, Accuracy, Availability
 - DoT Civil Community
- Multiple System Enhancements
- Cost Analysis
 - Single System
 - Multiple System

* I am in the the process of preparing an Executive Summary and Recommendations and need a Users' List and summary of DoT/DoD Congressional Actions from Ed McGann. I hope to have a report into Board Members hands by mid-summer 1989. It is planned to have copies for review and approval for selective dissemination by the WGA Board of Directors. The report may be ready for presentation at the 1989 Annual Convention.

Other Items of Interest

* The February 1989 IEEE Aerospace and Electronic Systems Magazine (Volume 4, Number 2) features the Joint U.S. and USSR Chayka Loran-C Chain on the front cover. (Coverage diagram and excerpts from the agreements, Ed.)

* The April 17, 1989 edition of Electronic Engineering Times (pp.35 and 38) cites Loran-C as an aid to vehicle monitoring systems. Very interesting article.

Who's Who in the WGA

1989 Board of Directors

John D. Illgen	President
James F. Culbertson	Vice President
John M. Beukers	Secretary
Carl S. Andren	Treasurer
James O. Alexander	
Robert D. Bronson	
Walter N. Dean	
Leo F. Fehlner	
Vernon L. Johnson	
Robert W. Lilley	
Edward L. McGann	
Maurice J. Moroney	
David C. Scull	
Jimmie L. Toms	
James P. Van Etten	

1989 Standing Committees

Audit	Cal Culver
Awards	Bob Frank
Constitution	Vern Johnson
Convention	Ed McGann
	Mike Moroney
	Frank Cassidy
	Per Eng
	Robert Goddard
	Jimmie Toms
	Daniel Callanan
Historical	Walt Dean
	John Castonia
	Bob Frank
	John Beukers
Journal	John Beukers
	Bob Lilley
	Dave Scull
	Walt Dean
	Bob Frank
Membership	Bill Garmany
Newsletter	Bob Lilley
Nominating	Jim Van Etten
	Bill Garmany
	Vern Johnson
	Ed McGann

1989 Special Committees

Publicity	Jim Culbertson
	Ron Wiener
Civil Radionavigation	Dave Scull
Congressional Liaison	Ed McGann
Dept. of Defense Liaison	John Illgen
Convention Planning	Bob Bronson

Additions and corrections requested.

The Vice-President Speaks Out

Issues Confronting the Board - The Need for Action

By Jim Culbertson

Publicity

Its time to start thinking again about publicity for the 1989 Convention. Now that the *Call for Papers* is almost a past issue, we should focus on what we want to send to media hyping the Convention itself. I am presuming that the meeting notice type announcements have all gone out via John Beukers database of addresses. I guess now we are looking at the news papers and technical publications - one idea is to write copy around particular papers that are to be presented - need input from Technical Chairman for this. Need some thoughts and comments from the Convention Chairmen.

1990 Convention

Jim Alexander and I met with Erika Faust and reviewed a contract for her to find and negotiate suitable facilities for 1990 Convention in SOCAL. I believe strongly that WGA and the membership will benefit from engaging someone like

...we should seriously consider professional assistance in executing the conventions and handling the business of registration

Erika. Even though Convention Chairmen have, in the past, successfully located and arranged for suitable facilities, the problems associated with negotiating with hotels, executing agreements and then following through to insure costs are minimized are getting more complex. We cannot continue to expect to get people to volunteer for the job of Convention Chairman without relieving some of the burden of having to find and negotiate for convention facilities and hotel accommodations that are suitable and within the budget and expectations of the membership. Additionally, the professionals at this business usually are able to negotiate better prices for facilities and rooms because they are experienced in dealing with the facility managers and they carry a certain amount of clout associated with

their reputations in arranging other conventions. Next, we should seriously consider professional assistance in executing the conventions and handling the business of registration, sales, etc. Good monitoring of the facilities management and staff by someone familiar with how other conventions are run will result in reduced costs. For example, simply insuring that WGA is charged for only the meals consumed at a luncheon (within a certain guaranteed percentage), regardless of how many tickets are sold, could save several hundreds of dollars!

Convention Documentation

I still have not seen the convention documentation that was to have been passed to the new Chairman (for 1989).....

The Direction the WGA is Going

For some time now we have been moving toward change in WGA. The Board for the past two years or so has generally agreed with John Beuker's plans for publishing an enhanced Radio Navigation Journal and increasing the membership. I am not sure we all appreciate the amount of effort and dedication it has taken to get this moving. At each Board meeting, John Beukers has attempted to brief us on the many tasks he has undertaken in conjunction with his "plan" and more recently as Secretary. It has often been overwhelming particularly if one has not been participating directly with John since the last Board meeting. This has led to some frustration by everyone including John Beukers, the Board and the Executive Committee. Some may see the changes as undesirable moves away from the "club" atmosphere WGA has enjoyed since formation. Others have expressed concern for "moving too fast" and for not really understanding the reasons for the structure that has been generated. Perhaps it is time we reviewed the bidding!

As Secretary, Leo Fehlner was among the first to point out that WGA could not increase membership beyond about 500 using the same equipment and traditional procedures for doing business. I certainly found this true when I served briefly as acting secretary. John Beukers has reconstituted the WGA membership

using a useful and modern database management system and now can keep track of responses from the inquiry cards as well as dues payments and notices. We are no longer restricted by the size of the membership. This database must be managed and updated, however, and this takes time and commitment.

In order to centralize where we "do business", the inventory of back dated Proceedings and Journals as well as the pins, T-shirts, golf shirts, hats, etc., also came under the management of the Secretary. This precludes moving all this material each time a membership chairman changes and allows a dynamic inventory to be maintained in the common database. Thus when requests come by mail for a copy of a Proceedings or Journal, the Secretary responds directly rather

Some may see the changes as undesirable moves away from the " Club " atmosphere the WGA has enjoyed since its formation

than having to forward the request to the Membership Chairman. Once the Membership Chairman develops "master" letters of welcome and letters in response to inquiry cards, the Secretary handles all the mailings to the prospective/new members directly. Similar procedures are, or could be, followed for each committee or responsibility in WGA thereby making the task easier to find volunteers who spend their time productively managing their responsibilities and are not bogged down in clerical work. The larger our membership grows, the more this will be the procedure we will be forced to follow!

...we must grow or GO!

The Proceedings Bibliography has been assembled by John Beukers so for the FIRST time we have a complete listing of all papers that have been presented at WGA Technical Symposiums! John Beukers did not work alone on this - he had a lot of very valuable input from others - but he did assemble the listing into the data base and again it took some-

one like John interested in making sure it was right and that history has been preserved as accurately as possible!

There have been a myriad of other improvements: our stationery, standards for the WGA emblem, new membership applications forms, new Fact Sheet, and in general a marked improvement of the "image" of WGA.

We have a lot of important traditions associated with WGA and I believe we should be careful not to "throw out the baby with the bath water!" There is a strong camaraderie between the "Geese" and many of our "old" methods are what have held us together so far. While some of these have to be preserved, others must go through some change, perhaps gradual, if we are to stay alive in the future.

WGA already has changed from being an "industry" and "government" oriented organization to one which must now look to "users" for the bulk of their support in the future. In exchange for this support, WGA must take on the leadership role of representing users in the radionavigation community. We must foster user forums so their causes can be heard and be the watchdog for the technical handling of loran by the all nations of the world. With user numbers over the million mark, we can't expect an organizations of 500 or so to be representing them - we must grow or GO. To grow we have to change the way we do business and that is what has been going on for the past couple of years.

John Beukers has been executing a labor of love with WGA the past two years or so and had made exceptional progress in moving us in a new direction. Eventually we will have to consider paying for the kind of services John has been providing - and of course with the membership swelling by ten fold or more there will be no other way to go. I support John in leading us in this direction as I believe WGA should continue to present a professional image and back that up with professional depth - we cannot do it as a Club!

Communications between Directors

My discussions with Board and Executive Committee Members indicate that we need to exchange more information between Board members in between Meetings. This will allow more efficient use of Board Member's time at the meetings and permit us to make better decisions when we are together. The Direc-

tors' Newsletter is one vehicle for doing this and I expect to see it used more and more for the purpose of doing business by keeping the Board informed between formal meetings.

Budget

One of the "communication" documents provided to the Board before the last meeting was the Budget. Based upon the lack of comments that either John Beukers or I have received, this budget apparently was of little interest to the majority of the Board members. If this is true, I believe we are in trouble!

To move ahead with our plans, we

...we must have a long range and near term operating budget and the Board MUST participate....

must have a long range and near term operating budget and the Board MUST participate in its formulation and approval. Any of us in business know we have to deal with budgets. Whether we believe it or not, Board proceedings are undertaking the "business" of WGA and we have a responsibility to the membership to do those things that are considered prudent in doing that business! I believe the budget is one of those prudent issues. The Board should address this at the next meeting and approve or disapprove the Budget.

Committee Reports

I have suggested to John Illgen that ALL Committee and Special Reports, normally presented at Board meetings, be prepared well ahead of time and distributed with the meeting agenda that arrives a couple of weeks before. Then at the Board meeting, all Reports can be quickly addressed/approved and the Board has more time to move onto important business.



Helpful Booklets

We purchased a number of booklets that cover various aspects of running an Association such as the WGA. There is a wealth of pertinent and useful information contained in these very readable aids for the non-profit organization. These are available for loan upon request but should be returned for others who might be interested. The titles are:

Association Non-Dues Income: 25 pages, published 1988, quick reading and german to the WGA.

A Guide to Association Committees: 53 pages, some good tips on committee modus operandi with check lists. Useful for committee chairmen.

Financial Management Handbook for Associations: 95 pages, Very useful for planning and budgeting. Gives statistical information developed from a survey of associations.

Association Legal Checklist: 78 pages, published 1983, updated 1987. Excellent reference material and pertinent information relating to taxes and tax-exempt status. Easy to read.

Federal Tax Treatment of Unrelated Business Income: 41 pages, third edition 1984. Contains some good definitions and pertinent to WGA activities.

Associations and Lobbying: 74 pages. The DO's and DONT's as it affects the tax treatment of income. Good reference material, comprehensive with sections of IRS code and Federal regulations.

Guidelines for an Association seeking a Chief Executive: 29 pages. Some helpful information for organizing a committee and making the selection. Applicable to the WGA downstream.

Retired Computer Needs A Home

After many years of loyal service the Osborne computer that Leo Fehlner used for administration of the membership has been supplanted by faster machines with more capacity. Leo would like to find someone who will take the Osborne plus operating software off his hands. Please call him at 301-622-0529 if you have an interest or know of someone who might be able to use the equipment.

Administration of the WGA

An Insight into the Databases in Use

by John Beukers

Currently, there are four databases in use for the purposes of administering WGA business. These are: Member/Non-member, Media, Manufacturers/Dealers, and Publications/Bibliography. Each database has been created in dBase III Plus on a PC DOS computer and is manipulated in either dBase or the faster compatible Foxplus. The data can be ported over to Apple Macintoshes for import into Foxbase/Mac. Database information can also be imported into Microsoft Word (PC or Mac) and Page-maker for word processing and presentation. It was suggested that directors would appreciate having some understanding of the files in use, therefore each of the next few newsletters will contain the structure and a brief explanation of the database files in use. Questions and comments are encouraged!

The member file has the name WGAMEM.DBF (the extension .DBF indicates that it is a database file). Associated with this are index files *.IDX or *.NDX, report files *.FRM, format files *.FMT (input screen definition) and program files *.PRG. The latter are generated to perform repetitive tasks such as report generation and are initiated with the statement "DO". The "*" indicates a wild card where any eight letter file designator can be used. The Member data base is used extensively. For example some 850 records have been either added or changed since the beginning of the year. Records are added and maintained at sessions that take place about every two weeks. There are currently 1058 records in the database which grows at about 40 records per session.

Structure of the WGA database for members and non-members, both active and archived.

REF	File reference, also member number.
FIRST_INIT	First initial
LAST	Last name
ADDRESS_1	First line of address, Company name etc
STREET	Street address
CITY	City
STATE	Two letter code for U.S. state, Canada province etc.
ZIP	Zip code, 5 plus 4 for U.S., Foreign as specified
COUNTRY	Country
HOME_BUS	Home or business address (H or B)
SALUTATION	Letter salutation, hold over from old database
SORT	Mailing sort field, domestic, Canada, foreign, resigned, prospect, etc.
HOME_PHONE	Home phone
BUIS_PHONE	Business phone plus extension
AFFIL	Member affiliation, information only, not for address
SPONSOR	Sponsor for members classed as "Sponsored"
SPECIALITY	Members speciality, hold over from old database
DUES_86	Dues paid in 1986, not used
DUES_87	Dues paid in 1987, not used
DUES_88	Dues paid in 1988, just a few entries and not useful
DUES_89	Dues paid in 1989, accurate and in use
DUES_90	Dues paid in 1990, accurate and in use for prepaid dues
DUES_EXPIR	Date that dues expire
CLASS	Class of membership, Individual, Corporate1, etc.
MEM_TYPE	Record type, member or non-member, e.g. Regular, Prospect, etc.
REFERD_BY	Member or prospect referred by, used with Manufacturers cards
DIRECTOR	Personal information, years members served as director
AWARDS	Personal information relating to members awards received
PRESIDENT	Personal information, years member served as President
OFFICER	Personal information, years member served as an Officer
COMMITTEES	Personal information, years member served on special committees
LAST_UPDAT	Date that record in the database was last updated
UPDATE_NO	Session number for updating of records
MEMB_SINCE	Date that member joined
COUNT	The number "1" is inserted for record counting in reports
SORT_CODE	Sort code for general use
ARREARS	Amount that a member is in arrears, not used
CURRENT	Current dues outstanding, not used
REMARKS	General comments relating to status or action pending
WELCOME	Indication that a welcome letter has been sent

Keeping Track of Correspondence

A daily activity of the Secretary's office that occupies a substantial amount of time is the response to incoming mail, telephone inquiries and requests and general correspondence associated with the membership. In addition letters are created to obtain information relating to current activities such as sorting out the WGA publications, obtaining an accurate media database, Journal matters and so on. To copy all of the correspondence for Directors to review or to report on this correspondence at Board Meetings is unrealistic and probably not required.

All of the outgoing correspondence is generated in Microsoft Word V.4 on the PC (momentarily to become V.5) which has an archiving and document retrieval system built into the software. When the document being prepared is saved, the writer is presented with a screen that requires an input calling for a title, keywords, and a comment line. The date, who created the document and its revision level are also recorded. A summary listing can then be printed of all of the documents created and saved in a directory.

This listing might prove to be a good vehicle to keep directors informed as to the correspondence activity. If there is a specific document of interest, a copy can be made and provided upon request. *Comments please!*

Membership

Here are the membership statistics as of May 26th.

Paid up members for 1989 or beyond

Individual	320
Corporate 1	5
Corporate 2	11
Associate	5
Sponsored	93
Life	24
Honorary	9

The total paid up membership, including life and honorary members, currently stands at 467.

(Continued on back page)

ION Meets June 27

WGA and loran will be well represented at the Annual Technical Meeting of the Institute of Navigation, to be held in Alexandria, Virginia, June 27-29. John Illgen is Chairman for the Session on *Interoperability and Integration* and John Beukers is the Chairman for a Session on *Loran-C Applications*.

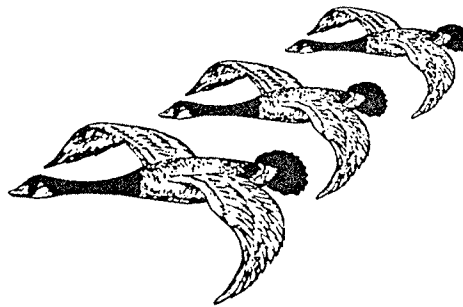
All speakers for the latter session are members of the WGA and the subject matter will stress loran applications. Among those presenting papers are Captain Henry Marx of Landfall Navigation, Ron Wiener of Azure Technology, Vincent Lally from the National Center for Atmospheric Research, Bob Lilley from the Avionics Lab., Ohio University, Bill Mooney from the MITRE Corporation and Walt Dean from ARNAV Systems, Inc.

Bibliography Nears Completion

(Continued from page 1)

Still outstanding in this effort to collect loran documentation is gaining access to the U.S. Coast Guard's comprehensive library of R&D reports. It is the objective to integrate each of these sources into the bibliography as and when obtained and to publish them in subsequent issues of the Journal of Loran Navigation.

If anyone can help in these endeavors, please contact the Secretary.



WGA Board Meeting

The 87th Board of Directors' Meeting is to be held on June 29th at 1300 hrs, in Alexandria, Virginia. This date and place was set to coincide with the Institute of

Next Board Meeting - June 29 Alexandria, Virginia

Navigation's Annual Technical Meeting which is being held in the Ramada Inn-Old Town, Alexandria. The exact room location of the Board Meeting has yet to be announced.

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

John Beukers
Beukers Promotions, Inc.,
Flowerfield, Building #7
St. James, NY 11780

Phone 516-862-7500
Fax 516-862-7403
Modem 516-862-7576

Membership

(Continued from page 5)

Members whose dues expired in 1988 and have not been renewed as of May 26th.

Individual	89
Corporate 1	1
Corporate 2	3
Associate	1
Sponsored	8

Production Notes

In case you are interested - This newsletter was created in Aldus Page-maker on a Macintosh II. The logo and Goose artwork were generated in Adobe Illustrator 88. Text was typed into Microsoft WORD 4 on a PC and Microsoft WORD 3.01 on the Mac. The "Missing Papers Section" was exported directly from dBase III and formatted in Page-maker. The body typeface is Palatino and the headings Helvetica. The tables are set in Univers Condensed.

Missing or Unpublished Papers

If you have a copy, please may we borrow to copy for our files.

114 Hoover	On the Circle of Uncertainty	Vol. 10-3
143 Rogoff	Viewnav - Precision Navigation, Planning, and Tactical Control	Vol. 12-4
174 McKenzie	How Good the Aircraft Are Doing With The Signals From Fox Harbor	Vol. 13-17
586 Roland	Loran Station Presque Isle - Prototype for the Future	Paper 1-1
587 Dean	How We Got To Where We Are	Paper 1-2
588 Parini	A Remote Target Locating System - PAVENAIL	Paper 1-3
589 Pasquier	Technical Description of the AN/PSN-6 Loran Personal Navigator	Paper 1-4
600 Doherty	Semi-Automated Loran Stations	Paper 3-9
668 Manning	West Coast Loran-C - The Promise and the Product (Abstract Only)	Vol. 6-12
683 Smoler	Practical Small-Vessel Installation of Loran-C Receivers	Vol. 7-3
684 Dishal	Exact Drive Requirements for Loran-C Transmitters	Vol. 7-4
686 Enias	Integrating a Loran-C Non-Precision Approach Capability into the National Airspace System	Vol. 16-2
687 Sedlock	Future of Loran-C	Vol. 16-3
688 Pfothenauer	Forging a Future for Loran-C/GPS Interoperability	Vol. 16-4
689 Solomon	Overview of Possible Establishment & Ranking Criteria for Loran Non-Prec. Approach Candidate Airports	Vol. 16-21
690 Beukers	Improved Tracking with Loran-C Cross Chain Capability	Vol. 16-27
691 Rogoff	The Precision Use of Loran-C in Harbor Navigation	Vol. 16-14
692 Spradley	The Datum Game...or, Will The Real North American Datum Please Stand Up?	Vol. 16-15
693 McCullough	Seasonal Loran Variations in New England	Vol. 13-24