



The Goose Gazette

The Newsletter of the Wild Goose Association,
the International Loran-C Navigation Forum

Special Winter Issue, 1990

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WGA members are encouraged to submit material for publication. Materials should be sent directly to the Editor. All other correspondence for the WGA should be addressed to the Association address below.

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A Special Message from the President:

To: The WGA Membership
From: Jim Culbertson, President

During his paper presentation on the second morning of the WGA Technical Symposium on Cape Cod, **John Beukers** asked the attendees to complete questionnaires. The results of this survey are very interesting and revealing and are discussed by John in this special newsletter issue. See pages 4 through 7.

Although no questionnaire provides perfect answers, I believe it is important to note the strong membership response to the direction WGA should be taking and the opinions regarding GPS Sole Means and Interoperability with Loran-C. I am using these survey results to help plan our work for the coming year.

H. Wychorski wins Student Paper Award

At the 18th Annual Technical Symposium of the WGA, the award for outstanding research paper in the Loran navigation field by a student, went to **Henry J. Wychorski, Jr.**, an engineer trainee at the RSPA, TSC, National Field Office for Loran Data Support, DTS-502. Mr. Wychorski is an undergraduate student at Northeastern University. An abstract follows:

CONSTRUCTION OF SEASONAL LORAN TIME DIFFERENCE USING A TEMPERATURE MODEL

Henry J. Wychorski, Jr.

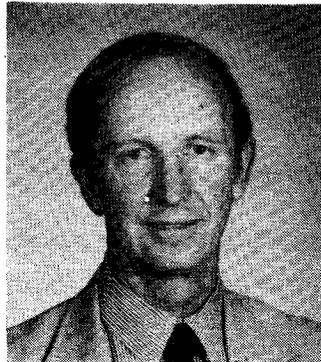
It takes three years of Loran data to characterize the seasonal variation of time differences. This paper will show how a historical temperature data base reduces the quantity of required data. Previous authors have identified the correlation between Loran time difference variations and the seasonal temperature change. This paper explains an unconventional procedure of substituting a years worth of temperature data (January to December 1988), for position location data, from six weather stations near Loran monitor

sites within the Northeast Chain, MWX triad. The procedure uses a time difference prediction algorithm developed at the Transportation Systems Center. The prediction algorithm resulted from a study that used multiple regression analyses of the geographical location of transmitters, monitors, data collection sites, and several years of time difference variations from each site. The result of the study is the prediction algorithm of three independent variables. This dissertation compares the prediction capability of the algorithm when one exchanges monthly averaged temperature data for the latitudes of the monitor sites. Successful application of this technique reduces the required data collection period by a third. The RSPA/TSC National Field Office for Loran Data Support, DTS-502, is developing a Loran data collection network and prediction system for the FAA. It is the basis for the current FAA program to open the 16,000 landing sites in the contiguous United States and Alaska to nonprecision approaches which otherwise are not programmed to have any instrument-aided approaches.

[Those "other" navigation systems have meetings and technical symposia too! We are pleased to receive this interesting news summary from ONSCEN, and to reprint it for our readers. Ed.]

Omega News

Heywood O. Shirer



[Mr. Shirer is currently the chief, Signal Analysis and Control Division, US Coast Guard Omega Navigation System Center. Before this assignment, he was the Marine Science and Technology Advisor on the Technical Assessment staff in the USCG Office of Research and Development, where he became familiar with USCG research in navigational aids. Prior to joining the Coast Guard in 1984, Mr. Shirer was an oceanographer with the National Oceanic and Atmospheric Administration. Mr. Shirer holds the B. S. degree from Clemson University and the M. S. from the American University.]

In April of 1989, Omega Station Managers and Commanding Officers, operating agency representatives and representatives from the Omega Navigation System Center (ONSCEN) met in Monrovia, Liberia, for the biennial Omega Station Manager's Conference. Held under the auspices of the International Omega Technical Commission (IOTC) and hosted this year by the Liberian Ministry of Transport, the conference gives station managers an opportunity to jointly discuss common technical and engineering problems and to report on unique approaches to these problems taken at their respective stations. The IOTC, which consists of one member from each partner nation's Omega operating agency, meets every two years to discuss Omega operating policy. The next meeting is planned to be held in Washington, DC in early 1990.

At the last International Omega Association (IOA) Annual Meeting in Munich, ONSCEN reported some concerns about the condition of the valley span antennas at stations Hawaii and Norway. Shortly after the meeting an insulator failed in Span 6 of Hawaii's antenna, seriously weakening the span. To prevent total collapse of the antenna, should span 6 completely fail, a weak link was installed in the cross- connect between spans 5 and 6. During the 1989 annual off- air maintenance period the damaged insulator assembly was bridged with a specially designed work platform which relieved the tension on the insulators, allowing the entire assembly to be replaced. This is the first time a major "in- place" repair was attempted on this antenna. During an extended off-air planned for 1990 the downlead (the vertical radiating component) will be replaced and Span 6, considered to be in the poorest condition, will be lowered for destructive testing. This testing will provide valuable information on the remaining life of the antenna.

Omega Station Norway has just completed the replacement of the second of their two antenna spans. The first span was replaced last year. Unlike Hawaii's antenna, the spans in Norway were designed to be lowered through a system of cables and pulleys leading from the mountain top anchor points to winches on the ground. The antenna is lowered to the surface of the fjord where it is supported by boats, rafts and buoys. Once it is completely lowered, the old span is reeled in; the new

span is then unreeled across the fjord and winched up to its operating height. The entire process is done during a normal two-week off-air period.

ONSCEN has recently developed, under contract with the Analytic Sciences Corporation (TASC), an index of performance or "System Availability Index" (Psa) for the Omega Navigation System. Psa is defined as the probability that an Omega user can effectively utilize three or more Omega station signals with a properly functioning Omega receiver at any time and location in the user's operating area. Although the system availability model (used to compute Psa) is applied to the Omega system, the methodology is general and could be applied to other radionavigation systems. The development is fully described in the report, "Omega System Performance Assessment, March 1989, Report No. CG-ONSCEN-01-89. This report is available to the public through the National Technical Information Service, Springfield, VA. 22161. Cite accession No. ADA 210 342.

The U.S. Coast Guard is establishing a NAVSTAR GPS Information Center (GPSIC) for GPS civil users at the Omega Navigation System Center in Alexandria VA. The Coast Guard expects GPSIC to begin interim service by the end of the calendar year.

The GPS information will be provided as a multimedia Operational Advisory Broadcast (OAB). The GPSIC services will be widely advertised as they become available. For additional information contact the Coast Guard GPS Program Office: Commandant (G-NRN-2) U.S. Coast Guard, 2100 Second St., S.W., Washington, DC 20593-0001, (202) 267-0298.

In other Omega news, the International Omega Association (IOA) held its Fourteenth Annual Meeting on the Hotel Queen Mary in Long Beach, CA,

Omega, from p. 2

from October 2 through October 6, 1989. Over 50 representatives from the international Omega community participated in this successful effort to foster continued interest in the Omega navigation system. Approximately 23 papers were presented during seven technical sessions by government, manufacturer, and airline representatives. Papers presented covered navigation system management, system design, avionics standards and certification, application techniques, and scientific-technical developments. The sessions also included an Omega tutorial and two user forums. The tutorial covered the theoretical basis of Omega radio navigation as well as engineering and operational characteristics. In the two user forums, moderated by J.A. Waltz of FAA, users shared their experiences with Omega and discussed plans, policies, problems, and support.

A reception was held at the Los Angeles Maritime Museum where principal North American manufacturers (Litton, Tracor, Canadian Marconi) had operating Omega airborne receivers on display. Magnavox had an operating SRN-25 marine receiver on display. A navigation field trip was arranged to visit the McDonald Douglas commercial aircraft plant where participants received a guided tour through the complete assembly line.

The IOA-14 Committee was composed of: General Chairman-Eric R. Swanson, Technical Chairman -Ian S. Anderson, Arrangements Chairman -Gregg A. Newton, and Registration -Robert L. Revel and Christopher A. Stevens. Copies of the IOA-14 proceedings may be obtained from the International Omega Association, INC.; P.O. Box 2324; Arlington, Va. 22202-0324; U.S.A. Proceedings are free to members of the IOA and cost \$50.00 per copy for non-members.

Annual membership fee for individuals in the IOA costs \$25.00. This includes a free copy of the proceedings and IOA Newsletters.

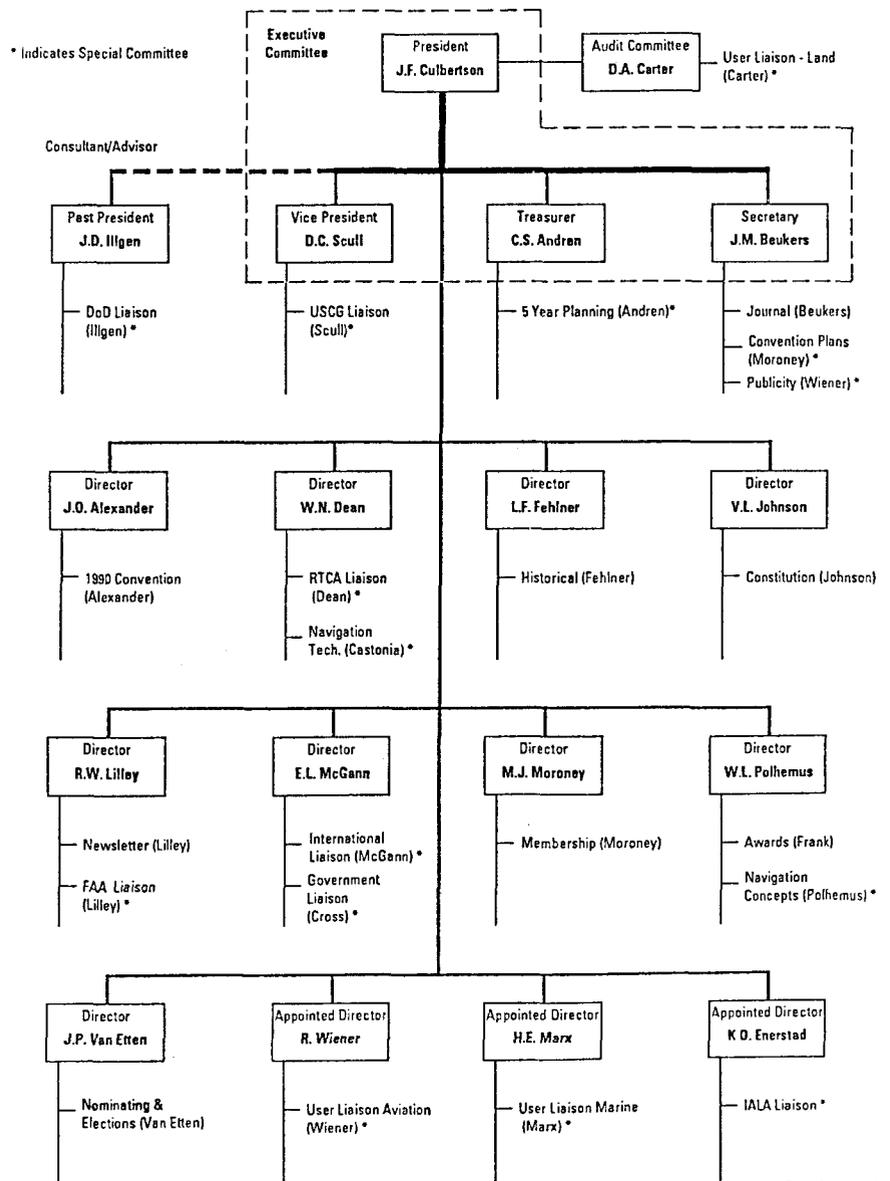
The fifteenth annual meeting of the IOA is planned for October, 1990 in the western Pacific. Details concerning dates and location will be announced at a later date.

FRP Watchdog Needed!

The WGA needs a volunteer to take the **Federal Radionavigation Plan** under wing (!) and become the resident expert on this publication; alerting WGA when comments or other actions are needed. Please help! Contact any WGA Director.

WGA Organization Chart

[Here is the organization chart referenced in the regular Fall Gazette; we just had too much news to include it there... ed.]



Results of Convention Questionnaire

Participants provide useful information with some surprises.

During the presentation of the paper entitled "The Wild Goose Association - Meeting the Challenge of Worldwide Loran-C Expansion", given by John Beukers, a questionnaire was handed to the session participants. The results of 89 completed responses have been tabulated and are presented graphically below and provide some food for thought.

The Vertical axis on each graph represents the number of respondents. The Horizontal axis on the graph showing the Product and Service priorities is a percentage derived from the Importance categories 1 to 3.

Many respondents changed the question relating to End User Priority to "a" priority rather than "the" priority. A number of respon-

dents added further categories of phase-in/phase-out years for the various navaid systems. The results have been prepared to reflect this.

Perhaps the biggest surprise is the priority that the membership puts on the WGA's political activity. This, along with the almost unanimous positive response to the Effective Communicator question is regarded as a clear signal that the WGA has an important role to play in influencing Radionavigation policy.

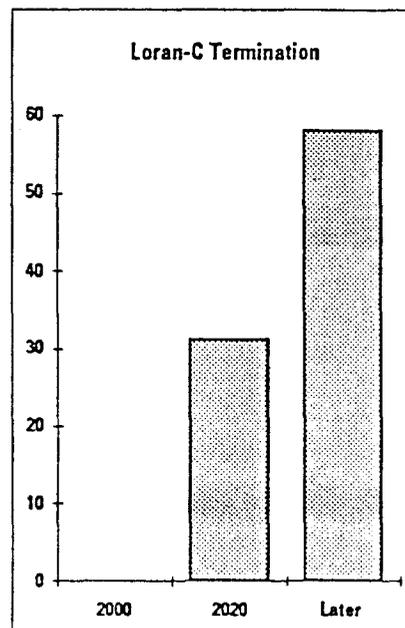
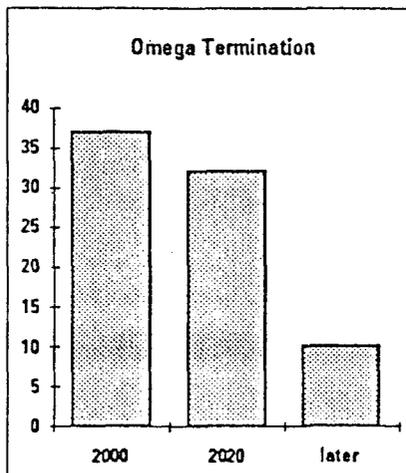
This information, along with the many comments and observations written on the questionnaires, will be useful to the Board of Directors in their deliberations formulating strategy for the 90's. Attendees to the session are to be thanked and congratulated for an effective overall response.

II. Radionavigation Policy

(a) Termination dates for Loran-C and Omega

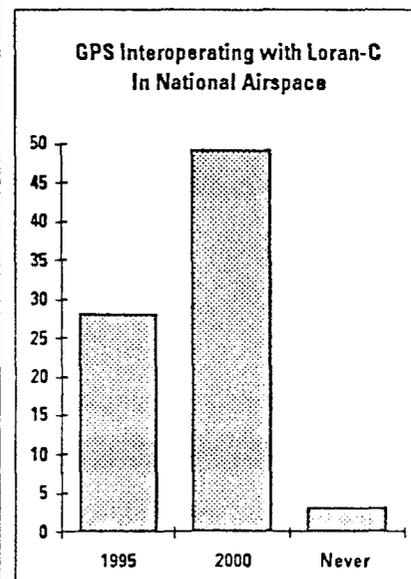
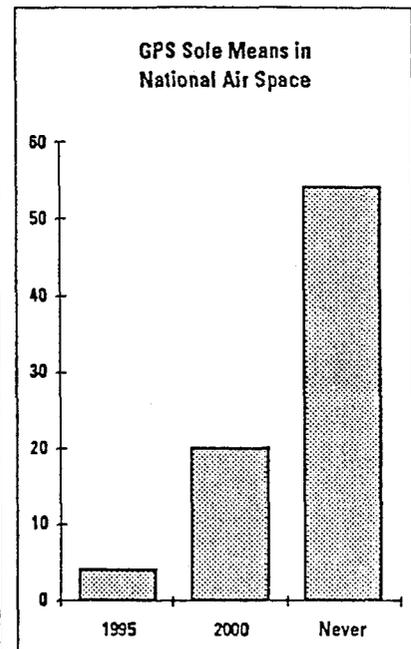
The prognosis for loran is a long and healthy life and one would trust that the government is listening. The WGA might indulge in some long range planning to be consistent with this thinking. On the other hand it would appear that our

sister organization, the International Omega Association, has some PR work to do. Perhaps it is not generally known just how much Omega is used worldwide.



(b) GPS Approval for Use in National Airspace

Perhaps it is no surprise to find that the majority do not consider GPS alone will satisfy the requirements for the U.S. air space. Technical analysis would appear to confirm this and official pronouncements are tending to support the position. Most respondents, however, consider a combination of Loran-C with GPS will provide a satisfactory navigation mix, but not until the latter part of the decade.



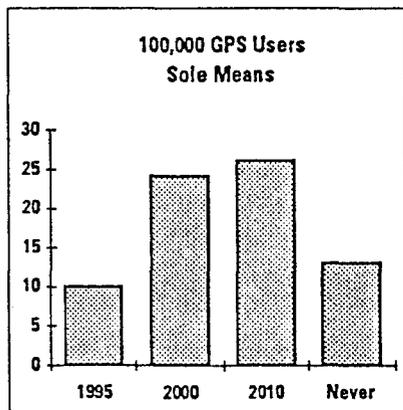
(c) GPS User Base of More Than 100,000

The wide disparity of answers to these questions probably reflect the uncertainty of DoD policy to the civil use of GPS and the delays associated with the program. The consensus is that interoperability will speed up the introduction of GPS although not until the latter part of the decade.

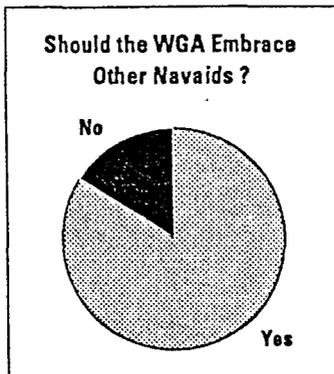
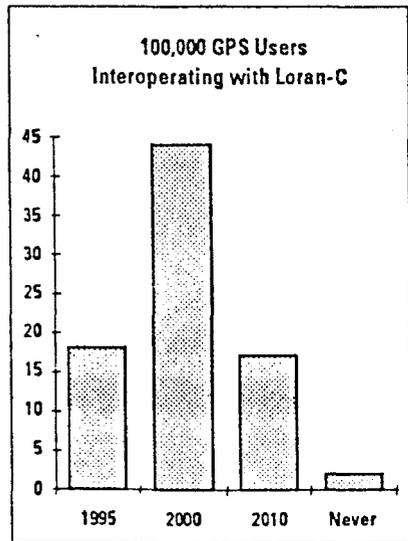
A conclusion could be drawn that to predict a market for GPS as a sole means of navigation could be hazardous!

An overwhelming majority of participants recommend embracing other nav aids - *if in conjunction with Loran.*

(i) Sole Means

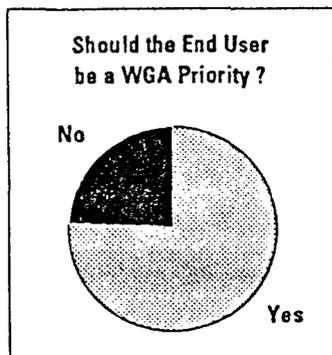
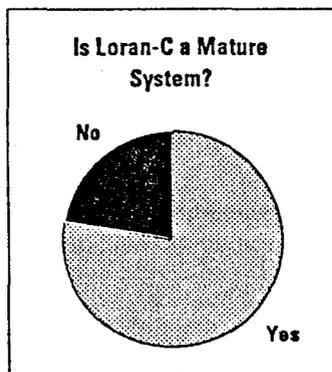


(ii) Interoperable



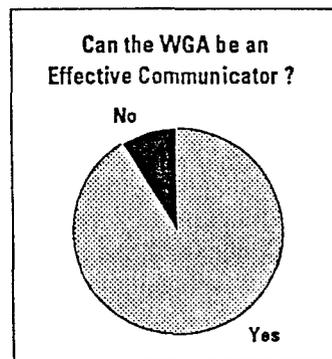
III Loran-C Maturity

A surprising number of respondents indicated that Loran-C was not a mature system and added by comment that there was much room for improvement. Quite a few made the point that the WGA should not abandon technical issues in favor of an End User priority.



IV Government to User and Back

While a majority indicated that the WGA can be an effective communicator between user and government and visa versa, several respondents qualified their replies with the observation that the Association's name was a negative factor.

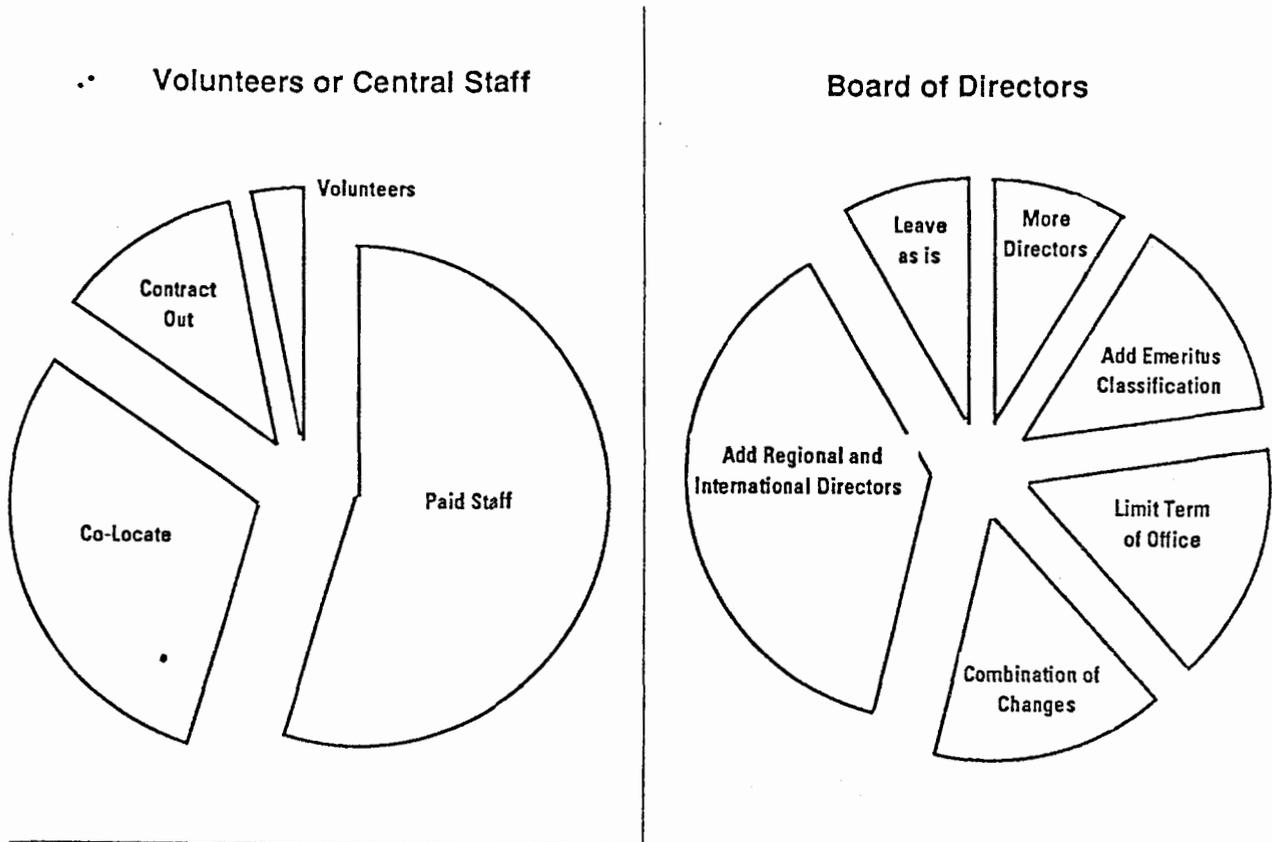


V Future of the WGA

One of the key issues to be resolved by the Board of Directors is the design of the Association's infrastructure to satisfy the world-wide interest in loran. The replies to questions, along with modifying comments, provide a good indication of the thoughts of the membership. This input is invaluable to formulating new directions consistent with the wishes of the membership.

(c) Volunteers or Central Staff

Administration of the Association is key to its on-going success. Few suggested that the WGA continue on a volunteer basis, but the responses were divided as to how to go about this. A majority indicated that a paid staff was the route to take with some reservations noted relating to dues structure and the ability to finance central staff. A number of possible organizations with which to co-locate were mentioned. The results are shown on the following page

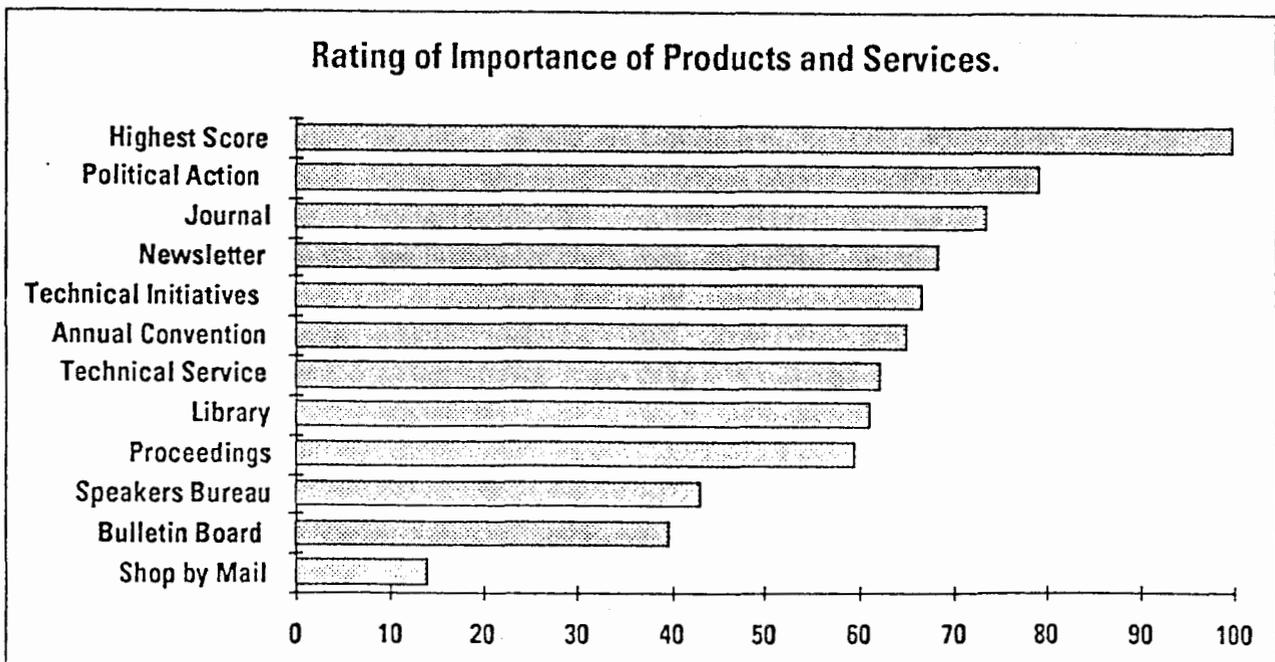


F. Products and Services

Using the ratings of 1 for high importance, 2 - useful and 3 - low priority, respondents answers were

summed and converted to a percentage. This provides an indication of the overall priorities that the Association might place on the

various products and services offered to satisfy the wishes of the membership. No additional suggestions were made.



WGA Participant Questionnaire

II. Radionavigation Policy

What dates do you consider to be realistic?

Loran-C termination	2000	2020	Later
Omega termination	2000	2020	Later
GPS approval for use in US airspace			
Sole Means	1995	2000	never
Interoperable	1995	2000	never
GPS user base of more than 100,000			
Sole Means	1995	2000	2010
Interoperable	1995	2000	2010

Should the WGA embrace other Nav aids to cover Loran-C Interoperability? Yes-No

III. Loran-C Maturity

Do you consider Loran-C to be a mature system? Yes-No
Should the End User be the WGA's priority? Yes-No

IV. Government to Userand Back

Do you think that the WGA can serve as an effective communicator between users and government? Yes-No

V. Future of the WGA

B. Manufacturers' Card Program

If you are a manufacturer and would be willing to become part of this program, please check the box and put your name and phone # below. Suggestions to make the program more effective would be welcome.

C. Volunteers or Central Staff?

What is your opinion on how best to run the WGA as we move *Boldly into the 90's*? Please check your preference.

- (a) From within using a paid staff.
- (b) Co-locate and share administration with another professional organization.
- (c) Contract to a professional administrative service.
- (d) Other, please suggest.

E. Board of Directors

Which alternatives do you favor for expanding the WGA Board of Directors? Please check your choice(s):

- (a) Change the Constitution to add more Directors.
- (b) Introduce an Emeritus classification.
- (c) Limit the term of office by introducing a sabbatical.

- (d) A combination of the above.
- (e) Add Regional and International seats.
- (f) Leave things as they are.

F. Products and Services

Please rate the importance of this list of products and services and add any that you would like to see offered by the WGA. 1- high, 2- useful, 3- low priority.

1. Annual Convention•
Admission to members at a reduced price.
2. Electronic Bulletin Board•
Set up and run a loran bulletin board on Compuserve (for example) for use by members and non-members.
3. Journal•
Spasmodic publication to be restored to annual and then quarterly. Publish user articles and letters.
4. Library•
To include back issues of proceedings, papers, newsletters. Loran bibliographies. Loran books. Chart availability and source information. Video rental: training, installation, technical.
5. Newsletter, Goose Gazette•
Published quarterly. Increase frequency to bimonthly then monthly. Communication through letters to the editor.
6. Political Action•
Collective clout in Congress to maintain and improve service. Vehicle for getting action on user concerns and requirements.
7. Proceedings•
Available to members not attending convention at a reduced price.
8. Shop by Mail•
WGA specialty items.
9. Speakers' Bureau•
Access to loran experts for speaking engagements.
10. Technical Service•
Access to loran technical panel to answer user questions.
11. Technical Initiatives•
Introduce and participate in initiatives to improve or secure service.

Name:
Phone:

Please use the reverse side of this sheet for comments and suggestions. You have the right to remain anonymous!

Loran-C Video Cassettes Available from the WGA

By arrangement with the producers, three Loran-C video cassettes are being offered for sale by the WGA. Two of these address loran for aviation interests while the third is directed towards the mariner. They may be obtained by writing or calling the Secretary at 516-862-7500 or by Fax 516-862-7403.

Loran - A Quick Refresher Course. Created by the U.S. Department of Transportation, Federal Aviation Administration, this 21 minute video provides a brief history of loran and then goes on to explain and demonstrate its current use in aviation. How loran is being introduced into the U.S. National air space is covered with a layman's explanation of Loran-C operation. The tape addresses the general aviation pilot and shows the advantages of Loran-C for area navigation and non-precision approaches. There is some tongue-in-cheek historical humor throughout! WGA member price is \$15 plus shipping (see below).

Loran-C and GPS as a Navigation Mix for the United States Air Space. This video was created by the Department of Transportation to describe and illustrate in non-technical terms, how Loran-C, together with the Global Positioning (satellite) System could be able to satisfy the future needs of the U.S. National Airspace. Just 10 minutes in length, it provides an excellent review of the two navigation systems and how they complement each other. The presentation is easily to follow by the lay person and yet commands the attention of the professional navigator or engineer. WGA member price is \$15 plus shipping (see below).

Loran-C - A Navigators Approach, Instructed by Capt. Henry E. Marx. This is a best seller amongst the small (and not so small) boat owners and provides a wealth of hands-on practical navigation instruction using Loran-C together with classic navigation techniques. To quote from Landfall Navigation's descriptive leaflet "....A Navigator's Approach is a 90 minute

instructional video tape that finally shows you the power and usefulness of your Loran-C receiver - in addition to teaching you how to navigate using the information provided. Capt. Henry Marx of Landfall Navigation has put his acclaimed Loran-C Navigation Course on video to clear up the mysteries of this amazing navigation system. The course includes a description of the Loran-C system, how it works and how to use the features of Loran-C receivers. Numerous Loran-C plotting problems and exercises are worked with the viewer and answers provided. A chart and plastic interpolator are provided. WGA member price is \$35 (regularly \$39.95).

Tapes will be shipped UPS ground from St. James, N.Y. U.S Domestic shipping costs are \$2.50 - \$4.00 depending upon zone.

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