The Goose Gazette

The newsletter of the *Wild Goose Association*, the international **loran** radionavigation forum.

Volume 91-2 - News of the Spring, 1991

The President's Message

Jim Culbertson

The Wild Goose Association officially participated in the formal dedication of the Mid-ContinentLoran-C chains on May 14, 1991. This long-awaited event makes it possible for Loran-C to be used on land, sea and air from coast-to-coast and into parts of Canada and Mexico. It was a gala celebration which included the Vice Commandant of the Coast Guard, **Vice Admiral Martin Daniell, Jr.**, Deputy Administrator of the FAA, **Barry L. Harris, Admiral Donald Engen**, former FAA Administrator and numerous other dignitaries.

Loran businesses had a number of exhibits and displays and hosted refreshments during the dedication and the coffee breaks the next day at the Loran-C Forum. **Mark Morgenthaler** and **Bill Polhemus** are congratulated on directing this effort. Megapulse, Inc. hosted a very nice sunset gathering by the pool featuring southwestern mexican cuisine and refreshments - thanks to **Ed McGann.**

Unfortunately, the Loran-C Forum was not as well attended as we all had hoped. The individual sessions, however, were filled with excellent information and lively discussions. Those who could not attend missed exciting and sometimes intense question-answer sessions.

My compliments and appreciation go out to those members of WGA, NASAO, the Coast Guard and the FAA who worked tirelessly to make the El Paso events come together. In particular, I want to thank **John Beukers** for hanging in there as WGA's official representative to the program office. As always, he demonstrated exceptional management and organizational skills, and patience in dealing with the wide variety of logistical issues and personalities inherent in any event of this type.

The business end of WGA now resides at NAVCOM System, Inc., Manassas, Virginia, thanks again to **John and Marilyn Beukers**. We are still getting things re-started, with **Dave Scull**, WGA Vice President acting as business manager. Those of you who have not received instant responses, publications you have ordered, etc., please be patient. Soon we will be up and running with a WGA telephone line for fax, modem and Integrated Voice Response. When you call, a fax or modem tone will be detected, or you can use touch-tones to obtain information or leave a message. Your messages will be responded to as quickly as possible but we are hopeful that the touch-tone information directory will provide most services. Until we obtain our own telephone line, you can reach Dave Scull at (703) 361-0884, fax (703) 361-0535.

In my presentation at the Mid-Continent Dedication, I committed the WGA to support Federal legislation that will provide statutory responsibility to an Agency of the Department of Transportation for the terrestrial applications and users of Loran-C (and other Federal radionavigation systems). Such support is provided for the maritime users by the Coast Guard and the aviation users by the FAA. This has significant impact on properly addressing the terrestrial users in the Federal Radionavigation Plan (FRP), and we hope that either the Coast Guard or the FAA would assist in getting this important legislation initiated.

Speaking of users, the Department of Transportation has announced the dates of the forthcoming User's Conferences as described in the FRP. The first will be a two-day affair in Washington, DC, on 19 and 20 November 1991 and the other will be in Seattle, WA, on 5 December 1991. Our FRP Committee will be preparing suitable official WGA inputs to these conferences.

I have suggested to the Department of Transportation that an additional Mid-Continent User's Conference be seriously considered. The new Loran-C chains provide valuable radio navigation service to a significant terrestrial (land-user) community and this service and these users should be duly recognized by and represented in the Federal arena.

I have had a preliminary look at the papers being considered for the forthcoming **Technical Symposium in Williamsburg, VA (1-3 October 1991)** and we are going to have a full technical program! I don't know when I have seen so many excellent papers being offered - the Technical Chairmen (**Dave Scull** and **Dave Olsen**) have their work cut out for them. Mark your calendars; you won't want to miss this one!

Inside:

THE WILD GOOSE ASSOCIATION
P. O. Box 556
Bedford, Massachusetts 01730

(703) 361-0884
fax (703) 361-0535

The Goose Gazette is an official publication of **The Wild Goose Association (WGA)**. Period of publication is quarterly, with cutoff dates of **1 March** for the Winter issue, **1 June** for the Spring issue, **1 September** for the Summer issue and **1 December** for the Fall issue.

Readers 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:

Wild Goose Association
P. O. Box 556
Bedford, Massachusetts 01730
(703) 361-0884

Editor: Robert W. Lilley
150 S. Plains Rd.
The Plains, Ohio 45780
(614) 592-1282

Publication Office:
Ohio University
Avionics Engineering Center
Athens, Ohio 45701
(614) 593-1514
Fax: (614) 593-1604

Printed by:

Messenger Publication Services
Athens, Ohio 45701

WGA Announces Administrative Changes

In view of the fact that the John Beukers' St. James, New York, address, fax and phone numbers have been used extensively by the WGA and others over the past three years, it is appropriate to include updated information in the *Goose Gazette*. The WGA Administrative Office has moved from St. James, New York and is being administered by **Dave Scull** at:

NavCom Systems, Inc.
7203 Gateway Court, Bldg. #7251
Manassas,VA 22110

Phone: 703-361-0884
Fax: 703-361-0535

The Association's permanent office remains in Bedford, MA as follows:

Wild Goose Association
P.O. Box 556
Bedford, MA 01730

John Beukers provides the following information:

Until the mid to end of July his address is:

John M. Beukers
8 Old Wood Road
Stony Brook,New York 11790

Phone & Fax: 516-751-0767

After this date he can be reached during the winter months at:

John M. Beukers
Grand Harbor
5080-106 Harmony Circle
Vero Beach, FL 32967

Phone & Fax: 407-563-0627

and other times at:

John M. Beukers
East Ridge
Longborough, nr. Moreton-in-Marsh
Glos, GL OQL
England

Phone & Fax: (from the U.S.):
011-44-451-30729

[Bon voyage, John and Marilyn! We'll be in touch!]

Geese or Ganders?

[The Gazette received this letter in response to our article on the Federal Radionavigation Plan:]

"I would like to point out an error in the Winter 1991 edition of The Goose Gazette (Volume 91-1). On page 4, it was announced that copies of the 1990 Federal Radionavigation Plan could be obtained by contacting Mr. E. J. Carpenter at the Volpe National Transportation Systems Center. I now know the source of the recent epidemic of mail I have received addressed to Mr. E. J. Carpenter! If you have occasion to publish announcements on the FRP again, please use my correct name, which is Ms. E. J. Carpenter.

Thank you very much.

Very truly yours,

Elisabeth J. Carpenter
Center for Navigation/DTS-52
Volpe National Transportation Systems Center
Kendall Square
Cambridge, MA 02142-1093

[We did not intentionally do this to test our readership, but an "epidemic" of responses shows we do have readers! Sorry, Ms. Carpenter. Ed.]

Did You Know?

Sharon Conner, secretary, and **Rose Putnam**, student assistant with the Avionics Engineering Center, Ohio University, are assisting with the word-processing necessary to publish the *Goose Gazette.*

WGA Loran Technology and Applications Committee

by Dave Amos, Chairman

The WGA Board of Directors has established a new standing committee called the Loran Technology and Applications Committee. This action came as a result of some suggestions by Leo Fehlner about the lack of recent WGA activity on the technical side of Loran-C, realization by the Board that some long-standing issues had been left to languish, and suspicion that there were other issues out there that needed focus, direction and leadership. I have accepted the nomination of the Board to chair the committee, and have asked a number of WGA members with particular technical focus to participate as members.

I feel that this initial membership is just that - initial. As we identify particular issues, I hope to recruit other members with specific experience to contribute to the committee's process. Our charter is to provide technical oversight on loran technology and applications. Our process will be to identify issues from any source available for us - from members who have cognizance of an issue, from the literature, from users, from Government sources for example - and to present the issues to the WGA Board of Directors. I expect to task one or more committee members to synopsize identified issues in white paper form which will include recommended actions to be taken WGA.

Examples of such actions may be official correspondence to cognizant authorities from the WGA Board and membership, redirection of the Committee's activity on the issue, or establishment of a WGA Special Committee to research, analyze, and propose a solution. I am actively soliciting your inputs to our new Loran Technology and Applications Committee work. Please give me the benefit of your experience, insight, and concern for the Loran-C technology by identifying your issues for Committee action.

I welcome anyone who wants to take advantage of the Committee's charter to work an issue of particular personal concern to join us in the process we have established. That is not a prerequisite, however, so you can send in your information and the Committee will take it from there if you don't have the time.

You can reach me at the following numbers - Office: 617-245-9090
Fax: 617-245-6311

Radionavigation Addresses and Numbers

Provided by the US Coast Guard

PROGRAM MANAGER

Commandant (G-NRN), U.S. Coast Guard, 2100 Second St. S.W. Washington, D.C. 20593-0001, Phone:202-267-0283; telefax:202-267-4427

REGIONAL MANAGERS

Commander (Ptl), Pacific Area, U.S. Coast Guard, Coast Guard Island Alameda, CA 94501-5100, Phone: 415-437-3232
For Loran-C chains: 9990/9970/9940/8290/7960/5990/4990

Commander (Atl), Atlantic Area, USCG, Governors Island New York, NY 10004-5098, Phone: 415-437-3232
For Loran-C chains: 9960/9610/8970/7980/7930/5930

Commander, Coast Guard, Activities, Europe, London P.O. Box 50, FPO New York, NY 09510-5000 - For Loran-C chains: 9980/7990/7970

COORDINATORS OF CHAIN OPERATIONS

Coordinator Of Chain Operations, U.S. Coast Guard Loran-C Station Box 28, Romulus, NY 14541-0028, Phone: 607-869-1334
For NEUS Chain 9960 and GL Chain 8970:

Coordinator Of Chain Operations, U.S. Coast Guard Loran-C Station P.O. Box 387, Malone FL 32445-0387, Phone: 205-899-5226
For SEUS Chain 7980 and SOCUS Chain 9610:

Coordinator Of Chain Operations, U.S. Coast Guard Loran-C Station Middletown, CA 95461-9999, Phone: 707-987-2911
For USWC Chain 9940 and NOCUS Chain 8290:

Coordinator Of Chain Operations, U.S. Coast Guard Support Center Kodiak, AK 99619-5000, Phone: 907-487-5583
For GOA Chain 7960 and NORPAC Chain 9990:

Coordinator of Chain Operations, c/o Far East Sect., U.S. Coast Guard APO San Francisco, CA 96328-5000
For NORWESTPAC Chain 9970:

OMEGA NAVIGATION SYSTEMS CENTER

Commanding Officer, USCG Omega Navigation Systems Center, 7323 Telegraph Rd. Alexandria, VA 22310-3998, Phone: 703-866-3800

Meetings and Calls for Papers

International Omega Association - Sixteenth Annual Meeting, "New Horizons with Omega," August 5-9, 1991 at the Sheraton Plaza in Vancouver, BC, Canada. Papers will be presented on Omega science and applications; differential Omega, interoperability with other navigation systems, defense applications... Contact Technical Chairman Darrell W. Davis of Trimble Navigation, (512) 873-2222, fax (512) 873-2211.

Canadian Coast Guard - **"Seventh International Sumposium on Vessel Traffic Systems,"** June 8-12, 1992, at the Hyatt Regency Hotel, Vancouver, BC. Sessions are planned on VTS technology, international expansion of VTS, environmental protection, the VTS operating environment and cooperation among VTS centres. Contact Richard S. Bryant, Secretary, by fax at (604) 666-6721.

15th Biennial Guidance Test Symposium, September 24-26, 1991, at Holloman Air Force Base, NM. Contact Ken Holland or Dora Walker at (505) 679-2500.

Papers are planned in the areas of test and evaluation of missile guidance and aircraft navigation systems and components, with emphasis in such areas as: Test and Analytical Techniques, Test Facilities,. Gravity Compensation, Ring Laser Gyros, Time-Space-Position-Information Methods, Integrated Navigation Systems, Differential GPS Techniques, Multi-Sensor Navigation, Artificial Intelligence, GPS Derived Attitude...

IEEE Aerospace and Electronics Systems Society - **PLANS** - Position Location and Navigation Symposium, "500 Years after Columbus - Navigation Challenges of Tomorrow," March 25-27, 1992, Doubletree Hotel and Convention Center, Monterey, CA. Contact the Technical Program Chairman, Michael J. Hadfield, (813) 579-6604 or-6128. Fax (813) 579-6027.

A wide variety of technical session topics will be presented:

Space-Based Navigation, Radio Navigation Systems, Inertial Sensor Development, Geodesy, Mapping, GPS Integrity/ Equipment/ Applications, Interoperability Issues and Approaches, Surface Vehicle Navigation, Aviation and Marine Traffic Control ...

Institute of Navigation, Satellite Division - **4th International Technical Meeting, "ION GPS-91,"** September 11-13, 1991 at the Albuquerque Convention Center, NM. Contact Technical Chairman Thomas Stansell at (213) 618-7095 or fax (213) 618-7341.

The meeting covers all aspects of GPS technology, integration and application. Student papers are invited.

Other meetings of interest...

Oceans '91, "Marine Communications and Navigation," in Honolulu, Hawaii, October 1-3, 1991. Contact John Illgen, one of the session chairmen, at fax (805) 968-1311.

IALA Mediterranean Loran-C Committee, 6th Meeting, St Germain en Laye, 25-27 June, 1991.

University of Missouri at Rolla - ANNIE '91, International Conference on Artificial Neural Networks in Engineering, November 10-12, 1991 at the Marriot Pavilion Hotel, St Louis, MO. Contact Dr. Cihan Dagli, General Chair at (314) 341-4374.

Federal Aviation Administration, Technical Center, **"First Annual International Satellite Surveillance and Communication Symposium,"** September 24-26, 1991 at Atlantic City, NJ. Contact Peter Massoglia, ARD-100, c/o Faye Francy, MiTech, Inc., (202) 408-2000 or by fax at (202) 789-1220. Those ADS and SATCOM papers would be welcome!

U.S. Hydrographic Conference 1992 - The fifth biennial National Ocean Service International Hydrographic Conference; February 25-28, 1991 Omni Inner Harbor Hotel, Baltimore, Maryland, U.S.A.; Theme: "Exploration Age to Information Age;" For further information call: Commander Georg e W. Jamerson, NOAA, 301-443-8536, fax 301-443-8459; or write: U.S. HYDROGRAPHIC CONFERENCE '92, P.O. Box 732, Rockville, MD 20848-0732.

... AND ... Don't forget our own **WGA TWENTIETH Annual Technical Symposium**, September 30 - October 3, 1991, at Fort Magruder Inn and Conference Center, Williamsburg, VA! General Chairman **Zeke Jackson,** Technical Chairman **Dave Scull** and Exhibits Chairman **Bill Parks,** all of NavCom Systems, Inc., are well underway on the planning. Contact NavCom at (703) 361-0884 or fax (703) 361-0535 for details.

The Conference Center just looks great! All the necessary and desirable facilities and activities are here, in an interesting and historical setting.

The Wild Goose Association 20th Annual Technical Symposium

"Bridging the Gap - Loran into the Next Century""

Coast Guard to Christen New Piloting Aid

by Todd G. Dickson

Submitted by **Len Sugarman**

[Reprinted from the Las Cruces, NM, Sun-News Saturday, March 30, 1991]

LA MESA- A 750-foot-tall antenna, an integral part of a high-tech navigation station on the edge of desert southwest of here, will be commissioned Wednesday by the Coast Guard.

The Coast Guard began building the navigation signal transmitter station almost a year ago as the final step of a $10-million contract to erect several of the towers across the United States. The object is to fill in a mid-continent gap of the guard's Loran-C, or Long-Range Aid to Navigation network, said Chief Bob Finsted of the station.

The system was first developed by the guard for ships to navigate without any land or sky references, Finsted said, and is now being used by small airplanes flying over the continent.

Once fully operational, Finsted said equipment would be able to triangulate a plane's position using the La Mesa signal and the signal from two of the other Loran stations - Gillette, Wyo. and Havre, Mont. These and other stations form two Loran chains for navigation by the estimated 100,000 general aviation aircraft in the United States equipped with Loran receivers.

Finsted said the transmitter sends out a continuous, precisely-timed signal for the airplane equipment to check against the other signals and determine the plane's position and course. This system is especially helpful for private aircraft trying to find small airports, he said.

Presently, Finsted said the workers at the station are testing the signal, which should be fully operational by mid-April. The commissioning ceremony makes the station an official Coast Guard unit, he said. A commissioning officer from the guard's district office in New Orleans will conduct the ceremony at 10 AM Wednesday at the station about 18 miles south of Las Cruces.

In a related matter, El Paso's Airport Hilton will be location of a Loran-C Users' Forum on May 15 to help pilots learn how to use the navigation system. Pilots from around the United States - as well as Canada, Mexico and other countries - will attend programs on what the complete Loran coverage means to aviation and aircraft operations and how it works.

FAA's Loran-C Implementation Plan

Comments are welcomed by FAA

Did you lose your copy? Get a replacement from **Dave Scull** *at NavCom Systems, or from the FAA Program Office.*

In our 1990 Special Fall Issue of the *Gazette*, we published the complete text of the draft FAA Loran-C Implementation Plan, which describes the process for initiating public-use instrument approach procedures using Loran-C. The FAA Loran-C Program Office desires wide circulation of this plan, and welcomes comments from WGA members and the community at large.

WGA reprinted the Plan this Spring, in time for distribution at the Loran-C Mid-Continent Dedication and User Forum, in El Paso, TX on May 14-15, 1991.

Please send your written comments to:

Loran-C Implementation Plan, AND-30
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

More Loran Family...

[WGA Received this letter from once and future member **Walter B. Ferm,** *now the Loran-C Project Engineer, NORCONSULT, Riyadh, Saudi Arabia:]*

"An addendum to the 'one small Loran-C family story,' contained in a letter from Life member **Christian Gloerson** of NORCONSULT and published in the Winter, 1991, Gazette.

"As Chris noted, I did follow **Tom Nolan** to LORMONSTA Eigeroy, but what Chris didn't know was, I later followed Tom to the Loran-C job in the Southeast Asia section office and after that, followed him to the Loran-C branch at Coast Guard Headquarters where incidentally, in 1972, I joined the WGA.

"It was only fitting that I should follow him over here to Saudi Arabia on this Loran-C project, only this time I finally caught up to him and served with him for the last year before he left and turned the job over to me.

"Now I suppose it's only right that I follow him one more time and reinstate my membership which I let lapse several years ago. ... I would like membership information, please."

[Welcome back! Info is in the mail. Ed.]

Lost and Found

In the Winter, 1991 *Gazette*, we listed **CDR Gaetano Martini** as a "lost goose." This apparently surprised CDR Martini, as he is still at the USCG Electronics Engineering Center in Wildwood, NJ, and is receiving WGA mail. We apologize for any inconvenience.

WGA will continue our search for any geese which appear to be difficult for the Postal Service to find. Members are urged to notify WGA of any address changes.

IALA Policy on Terrestrial Radionavigation Systems

Approved by the IALA Council, April 23-24, 1991 -- submitted by **Norman Matthews**, Secretary-General, IALA

INTRODUCTION

In the mid 1980's the Government of the United States of America decided to withdraw support for Loran-C stations outside of the mainland of the United States with effect from December 31, 1994. When this decision was reached the US Government indicated it was prepared to hand over the stations to host countries if they wished to continue the service after 1 January 1995.

Consideration of this matter by the host countries and by other countries likely to be affected by a closure of the Loran-C system indicated that there was an operational requirement for a terrestrial radionavigation system to complement satellite radionavigation services. It was also considered that the system chosen should preferably be one over which the countries concerned could exercise some measure of control. Of the terrestrial systems available, Loran-C was generally favoured because of the extensive operational range which can be covered by a chain.

In parallel with this work, the USSR was re-considering the priorities of the Chayka system, and concluded that civil use of the system was now of more importance than its military use. In view of this, and recognising that the Chayka and Loran-C systems are similar in concept, design and operating frequency, an Agreement was made between the USA and the USSR to develop a joint Loran-C/Chayka chain in the Bering Sea.

As a result of these activities, the coverage of the world by Loran-C, Chayka and joint Loran-C/Chayka chains is likely to increase substantially over the next few years. This will have the effect that Loran-C/Chayka will become the world-wide standard terrestrial radionavigation system.

IALA has played, and is continuing to play, an important role in the development of the coverage of Loran-C and joint Loran-C/Chayka chains. In particular IALA has:

- convened a meeting in London during March 1987 to discuss Loran-C in NW Europe;
- convened meetings of Mediterranean Littoral States to discuss Loran-C in the Mediterranean;
- convened meetings of Far Eastern countries to discuss Loran-C and Chayka in Far Eastern waters;
- held informal meetings with the USCG and the USSR to discuss criteria for the compatibility of Loran-C and Chayka systems wherever it is practicable to operate joint chains.

In view of the expansion of the Loran-C and Chayka systems, including the possibility of joint operation of the systems, and the leading part being taken by IALA in these developments, the IALA Council has adopted a policy to support and encourage cooperative efforts between member nations to expand coverage of these systems throughout the world, wherever this is practicable.

The formal statement of policy [follows].

IALA Policy on Terrestrial Radionavigation Systems

The International Association of Lighthouse Authorities:

CONVINCED that there will be a requirement for a terrestrial radionavigation system, to complement global satellite navigation systems for the foreseeable future;

CONSIDERING that to reduce costs to users and providers and to maximize the usefulness of the system, a standard terrestrial radionavigation system should be adopted where possible;

RECOGNIZING that the inter operability, long-range, high availability and accuracy of the Loran-C and Chayka systems make these preferred systems for adoption as a standard, worldwide terrestrial radionavigation system;

HAS ADOPTED A POLICY to support and encourage cooperative efforts between member nations to expand and improve Loran-C and Chayka coverage throughout the world, including the establishment of joint Loran-C/Chayka chains, wherever this is practicable.

US Hydrographic Conference '92

Call for Papers

The National Oceanic and Atmospheric Administration's (NOAA) National Ocean Service, The Hydrographic Society of America, and the International Federation of Surveyors (FIG), will host the US Hydrographic Conference '92 on February 25-28, 1992. The Fifth Biennial National Ocean Service International Hydrographic Conference will be held at the Omni Inner Harbor Hotel in Baltimore, Maryland, U.S.A.

Since 1992 is the 500th anniversary of the voyage of Christopher Columbus to the North American continent, the conference theme, "Exploration Age to Information Age," signifies the transition from the accomplishments of Christopher Columbus during the Exploration Age to the latest technological advances in navigation and hydrography of the Information Age. The conference has been endorsed by the Christopher Columbus Quincentenary Jubilee Commission as an official commemorative project.

Technical papers will be presented on a variety of hydrographic and oceanographic related subjects. Hydrographic data are now much more than basic navigation information. New technologies for marine surveying and data handling are creating data sets of such high quality and resolution that they are becoming primary sources of information for other activities concerned with managing, protecting, and exploiting coastal and offshore resources. This theme provides opportunities for a wide variety of presentations from a number of scientific disciplines connected with the hydrographic, oceanographic, ocean industry, and coastal zone management communities.

Exhibits form U.S. Government agencies and private vendors from around the world will also be featured. The final day of the conference will be devoted to an Electronic Chart Workshop which will provide a report and discussion of the U.S. electronic chart test bed project, including field tests and evaluation of the International Maritime Organization (IMO) Provisional Electronic Chart standards.

NOAA's National Ocean Service is the Federal agency responsible for the hydrographic surveys of all US coastal waters and the Great Lakes, and the production of nautical charts and related navigational products. The Hydrographic Society of America is the U.S. branch of the international Hydrographic Society, whose membership includes hydrographic surveyors, equipment manufacturers, and users of hydrographic information. The International Federation of Surveyors (FIG), an affiliation of representatives of over 50 professional surveying and mapping organizations from nations around the world, conducts training, education, and technical and scientific studies in all aspects of surveying. Commission 4 is the component of FIG which is concerned with hydrographic surveying.

For further information on the conference, call CDR George Jamerson, NOAA, telephone number 301-443-8536, or fax number 301-443-8459.

Send written inquiries to US Hydrographic Conference '92, P.O. Box 732, Rockville, Maryland 20848-0732, USA.

Loran User Manual Being Updated

WGA is in contact with **Mr. Dan Maxim,** who is working with the Coast Guard to update the Loran-C User Manual. WGA will be providing some technical, glossary and user information, and will participate in reviews of draft materials for the new manual.

Interested members should contact Dan at (609) 655-7426.

Membership

Any individual or organization that has an interest in loran is eligible for membership. There are several classes of membership:

Regular

Two classes of individual membership are available: annual and life. The life membership fee is $200.00. The annual membership is $25.00 for the first year and $20.00 annually after the first. Members in countries other that the U. S., Canada and Mexico are assessed an additional $10.00 per year to defray international mailing costs.

Organizational

Associate membership is provided for organizations which desire only to receive WGA publications. Associate membership is $105.00 first-year and $100.00 annually thereafter, and does not carry the privelege of voting or holding WGA office.

Corporate Classes 1 and 2 memberships provide options for organizations that wish to be involved directly in WGA activities. Class 1 permits nomination of ten regular members from the corporate member; Class 2 permits five. Dues for Class 1 are $435.00 first year and $400.00 after. For Class 2, dues are $220.00 and $200.00.

WGA Charter

"The Wild Goose Association is formed to provide an organization for individuals who have a common interest in Loran and who wish to foster and preserve the art of Loran, to promote the exchange of ideas and information in the field of Loran, to recognize the advances and contributions to Loran, to document the history of Loran, and to commemorate fittingly the memory of fellow Wild Geese."

Some Loran-C Questions and Answers for Aviators

Compiled for Panelist Guidance at the Loran-C Mid-Continent Dedication and User Forum, El Paso, May 15, 1991

1. I use VOR now; is loran different?

Loran provides the same information (and more) to the pilot that VOR and DME do. Receiver operation is very different from VOR/DME, and different brands of receivers require very different button-pushing. You cannot assume you can just rent an aircraft and go flying, expecting the loran receiver to work for you. An unfamiliar loran receiver requires some reading and practice. Do NOT attempt to learn as you fly; it produces too much head-down time.

One difference you will notice is that loran gives full information even close to the ground (or during taxi). Loran is not a line-of-sight system as are VOR and DME. Loran-C does NOT replace flight charts! You will still need the charts to be certain you have entered the correct waypoints for the loran receiver (and to be legal!)

2. Some loran receivers are VFR only and some are advertised as IFR. Why?

Basically the differences are in the performance criteria to which the receiver is built, and the test limits which the receiver must meet. Do NOT depend upon a VFR receiver in instrument conditions. It is a violation of FARs and is unsafe.

3. There are instrument approach plates for LORAN now; who can use these today?

FAA published Loran-C approach procedures in November, 1990 as part of the continuing loran program. It was thought at the time that receiver certification would follow immediately. Unfortunately, certification tests revealed some unexpected issues, which are now being resolved by FAA and others. Therefore, the only loran approaches which are legal today are limited-use procedures performed by pilots and aircraft authorized under the Early Implementation Program. These are NOT the procedures which appear in the approach plate books.

It is UNSAFE to use these approaches in instrument conditions with a current-day receiver. Until receivers certified FOR APPROACH USE under FAA Technical Standard Order C60b are available, the published approaches are not authorized.

4. When will receivers for instrument approaches be available?

At least one receiver manufacturer has completed TSO testing, except for final flight tests. Data are being evaluated and, as an estimate, we should see a certified receiver this summer. Others will surely follow.

5. Will they be more expensive than VFR receivers?

Yes. The higher level of performance and error-checking requiured for approach use do drive the cost upward, as does the very stringent testing program required by the TSO. Even so, the fully-capable loran receiver offers much useful information for the pilot, at a cost expected to be comparable to full-capability VOR/DME systems. In the electronics industry, prices do tend to fall as competition increases; even in the relatively small aircraft IFR market, this happens.

6. When will more loran approaches be available?

Twenty additional approaches are under development at this time. The states, with NASAO guidance, have submitted priority lists totaling 500 airports, which have been accepted by FAA as candidate sites foor loran approaches.

7. Why loran approaches anyway?

Loran-C approaches are cost-effective. They require a minimum of ground support equipment. Other approach types require transmitters on or near the airport, with higher installation and maintenance costs.

8. Then why not put them at ALL airports?

There are some limitations on any kind of lateral-only (no glide slope) approaches; terrain or other obstructions can get in the way. Also, every approach procedure must be checked periodically by FAA aircraft to insure continued safety; this does cost money. Therefore it is prudent to install such procedures at places where they will get a reasonable amount of use.

9. What do I have to do to get an approach-certified receiver put in my airplane?

Once TSO C60b approach-certified receivers are available, you must have the receiver installed according to all appropriate FAA guidance materials for IFR use (see a qualified avionics shop). The FAA form 337 must be filled out, specifically noting the approach capability. Additionally, an approved flight manual supplement must be obtained for the loran receiver, describing its correct operational procedures IN THAT AIRCRAFT. In other words, the procedure is the same as for other IFR-certified installations in the aircraft.

10. What about the mid-continent gap?

As of this summer, there "ain't no such thing." Loran-C signals are now available throughout the U.S. Receiver manufacturers are presently modifying their units to receive the four new mid-continent transmitters.

11. Will loran replace VOR and DME?

Some people think that a combination of loran and GPS may ultimately provide a "sole-means of navigation" system which could replace the VOR/DME system. Don't sell your VOR yet. Loran-C is a SUPPLEMENTAL enroute IFR system, and you must also have VOR on board. This supplemental designation of loran is necessary for a variety of technical reasons, with safety as the base. Safety is the reason that monitor/data-collector units were deployed nationwide to support approach use, and the reason that the loran transmitters will be modified late this year, to provide further automation of monitoring/alarm functions to protect the approach user.

12. What about GPS? Should I just wait and get a GPS receiver?

GPS can and probably will eventually provide services similar to loran services available today. It is very unlikely that GPS as we now know it will soon be used provide instrument approaches with vertical guidance. GPS, like loran, will first have to go through system and receiver tests. The criteria for testing and procedures for safe use by pilots will have to be created. As we are seeing with loran, this all takes time. How much time remains to be seen.

Many of us feel we have learned much from loran that can be applied to GPS; the systems are both "earth-referenced" and are similar in the ways pilot information is produced. In short, loran is here now and will be here for years to come; GPS will likely offer similar services in coming years (not months). Many think the best idea is ultimately to merge loran and GPS signals into a hybrid navigation receiving system, using the strengths of both.

13. Why is it all taking so long?

Because it MUST be proven to be safe all the time. US DOT, FAA, the Coast Guard, NASAO, AOPA, RTCA and a remarkable task force of government, users, manufacturers and contractor (and volunteer) professionals from industry and universities have supported this long program of development and demonstration of loran's utility, reliability and integrity.

14. Where can I get more information on loran?

WGA - of course! WGA has a bibliography of technical information; our Technical Symposium proceedings contain both technical and practical papers.

US Coast Guard -ask for the Loran-C Users Manual; this is being updated now, so get on the mailing list for the new version.

Dealers-ask for books (real books, not sales brochures alone). There are several good, easy-to-read books.

Fellow pilots or mariners- ask for a demo ride

FAA-Advisory Circular 20-121

Note that loran is a relatively new product to some dealers, and also that some dealers have been "oversold" on GPS. Be an informed buyer through reading and talking to other loran USERS before you decide.

Loran Manufacturers and End Users Need Help

A letter to WGA from **Bud Kaczor,** *Sea Dog Marine, Inc.*

With the price of a full function Loran-C unit under $250 many people are now purchasing units. Some of these units actually perform as advertised and some don't. The main problem, however, is the lack of basic navigation skills and/or a lack of interest in learning these skills by these new users.

Many people purchase their new Loran-C expecting it to be as easy to operate as a VHF radio; it isn't. The next step is to read the instruction manual and attempt to get the unit up and running. Some people with a technical background are able to do so without too much trouble. Most others are totally confused and frustrated from the first page and end up using this unit for nothing more than a night light. The solution obviously is education, which translates to time spent learning basic navigation skills and loran functions.

I attempted to solve this problem in 1986 with the publication of my Loran- C Handbook. The handbook starts out with proper installation and noise suppression procedures. The next chapter covers initial start up plus GRI and secondary selection for most units produced up to 1984. Newer units are provided by way of free supplement by mail. These simplified instructions take the user to a point to store as a waypoint then walk the user step by step through the sequence of recalling the waypoint and returning to it using range, bearing and crosstrack. Once the user has done this I find that the remainder of the obstacles to navigation by loran comes easy. The balance of the book covers charting, compasses, theory and troubleshooting.

In addition to the handbook I write the electronics column for Walleye Magazine which deals mostly with Loran. I also conduct approximately 30 seminars annually in the Ohio, Michigan and Pennsylvania area for the past 7 years. For those who need more help because of lack of time to learn the basic skills on their own, I tutor individuals and usually adjust the compass at the same time. Another need that begged to be supplied was a ready made list of addresses, Lat-Lonof waypoints, to go to. I initially made a list of waypoints, but found that users were confused as to where the points were. To solve this problem I copied the NOAA charts of Lake Erie, Western Lake Erie and Lake Huron including the Georgian Bay and North Channel. I placed numbers by the Waypoint position and referenced to an accurate list of waypoints including points accurate enough to be used as calibration points to match the loran to the local chart.

The problem I have remaining is where exactly is the best place to change GRI chains and or secondary stations. For example, the Coast Guard coverage charts do not show specifically where the 9960 GRI stops and the 8970 GRI starts in the Western Lake Erie area. Consequently several loran companies have programed their units to pick and use the 8970 GRI chain in automatic mode in this area. This causes untold confusion on the part of the user because only the 9960 GRI is overlaid on the Lake Erie charts. With the addition of the new mid-continentchains I am sure that data need be compiled by WGA members so as to define the GRI and TD borders for future use by loran manufacturers and interested parties.

Another related problem that needs to be addressed is that of overlaying only TD lines that should be used on a particular chart, on that chart. For example, the Lake Erie chart is overlaid with all four TD's for the 9960 GRI. The problem is that the W & X TD's have very large LOP gradient since Lake Erie is in the baseline extension of the master in Seneca. This has caused many Eastern Lake Erie users to use one of these two stations instead of the Y secondary. It's no wonder that the pierhead at Erie PA seems to move around for these users. Another example of this problem is the Lake Huron Chart that is overlaid with both the 9960 and 8970 GRI, five rates altogether. There are so many TD lines on this chart that the water area is hard to find. National Oceanic Services advised me that this cannot be changed until the Coast Guard addresses the problem and gives the okay. What is needed is new coverage diagrams showing the recommended GRI and secondaries for each area and the GRI changeover points for each where there is overlap. The Coast Guard and WGA members should get together in this effort, to insure accuracy and continuity so that the manufacturers and the end users don't have so many problems.

Bud Kaczor, President, Sea Dog Marine, Cleveland, Ohio

Sponsorship

WGA thanks the following organizations for their support of the Mid-Continent Dedication and User Conference, El Paso, TX, May 14-15, 1991.

Refreshments Sponsors:

El Paso Aero/Avionics Associates Inc.
Bendix/King
JET Technology
Synetics
Trimble Navigation

Exhibitors:

U. S. Dept. Agriculture, Aircraft & Equipment Operational Facility, Mission, TX
Province of Ontario, Ministry of Natural Resources
Chevron - USA
U. S. Naval Observatory
Megapulse, Inc.
U. S. Army, Fort Sill, OK
Navigation Data Systems, Inc.
DOT/RSPA Federal Radionavigation Plan Office, VNTSC
Technology Projects, Ltd.
UPS/II Morrow, Inc.
State of Vermont, Agency of Transportation
El Paso Avionics Associates
Lifeguard Air EMS, Albuquerque, NM

Hawaii Chain to Shut Down in 1992?

[WGA received this letter from USCG, requesting our help.]

Your Comments and Ideas Needed!

Should WGA suggest alternatives? Reconfiguration in the Pacific? International involvement? Who uses this chain, and for what? Would usage increase with reconfiguration? With higher power? Should FAA get involved?

Please help your Board of Directors develop a WGA position on this issue, and soon! Contact any Director, to get your comments into the agenda for the Board of Directors meeting on July 18.

Dear Captain Culbertson:

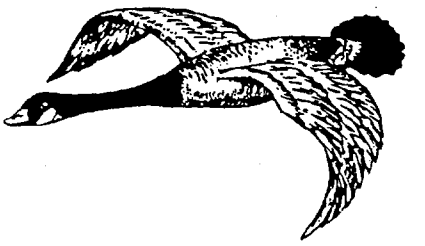
We have done a lot of groundwork in assessing the continued need for the Central Pacific Loran-C chain. The Coast Guard operates this chain in response to a Department of Defense (DOD) requirement that expires not later than December 31, 1994. The feasibility of closing the chain at the end of calendar year 1992 is very real. This issue has high level interest within the Coast Guard because of the substantial saving that may be realized by early closure.

We have already started to assess the various user communities, i.e., DOD, civil maritime and civil aviation. I have requested DOD to reassess their needs for the Central Pacific chain through 1994. Our District Office in Honolulu is canvassing the civil maritime users in Hawaii. I have also asked the Federal Aviation Administration Program Manager to assess the needs of the FAA and civil aviation community. I will be soliciting comments via a Federal Register Article. Congressional interests will also be made aware of this issue.

I would like to solicit your comments, as the major Loran-C civil organization, to assist in our decision making process. Your comments will be a valued input. Your earliest response will be greatly appreciated.

Should you have any questions on this matter, please contact me at (202) 267-0283, or CDR Armstrong at (202) 267-0990.

J. F. Weseman Captain, U.S. Coast Guard
Chief, Radionavigation Division



AIR, MARINE, AND LAND RADIONAVIGATION SYSTEMS USERS

1990 FEDERAL RADIONAVIGATION PLAN

1991 CONFERENCES

* * * * * *PRELIMINARY ANNOUNCEMENT* * * * * *

The U.S. Department of Transportation is conducting open meetings for all users of U.S. Government-provided radionavigation systems. The purpose of the meetings is to obtain user perspectives on Federal policies and future plans for these services. Federal radionavigation policies and plans are outlined in the 1990 DOD/DOT Federal Radionavigation Plan, single copies of which are available from the Volpe National Transportation Systems Center. Users are encouraged to attend the meetings to provide inputs for the 1992 plan.

LORAN-C	VOR/DME
OMEGA	MLS/ILS
TRANSIT	GPS
RADIOBEACONS	

SPONSORS:

Research and Special Programs Administration
Federal Aviation Administration
U.S. Coast Guard

DATES/LOCATIONS:

November 19-20, 1991: Embassy Suites Hotel, Alexandria, Virginia
December 5, 1991: Sheraton Hotel and Towers, Seattle, Washington

INFORMATION:

Federal Radionavigation Plan:

Elisabeth J. Carpenter
Volpe National Transportation Systems Center (VNTSC)
Center for Navigation (DTS-52)
55 Kendall Square
Cambridge, MA 02142-1093
(617)-494-2126

Conferences:

VNTSC
Conference Office (DTS-930)
Attn: Radionavigation Users Conference
55 Kendall Square
Cambridge, MA 02142-1093
(617)-494-2307

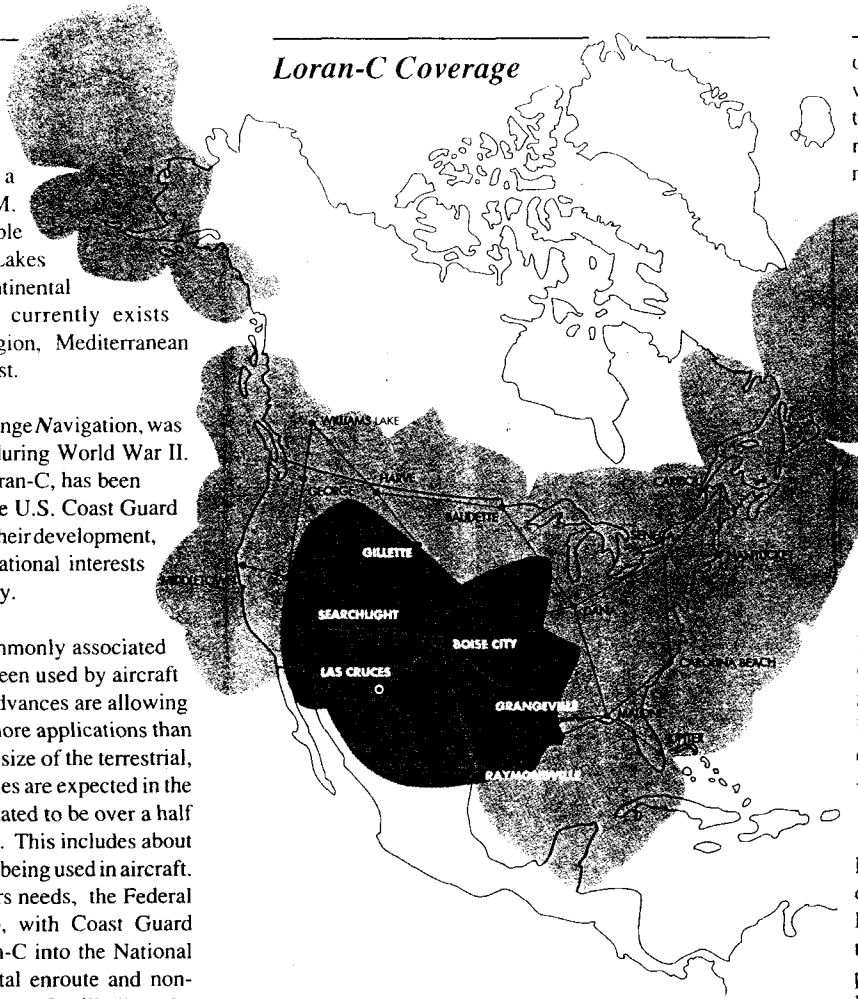
On April 3, 1991, the United States Coast Guard commissioned the last four new Loran-C transmitting stations at a location near Las Cruces, NM. Loran-C coverage, once available only in U.S. coastal and Great Lakes areas, now includes the entire continental U.S. Loran-C coverage also currently exists throughout the North Atlantic region, Mediterranean Sea area, and much of the Far East.

Loran an acronym for ***LO***ng ***RA***nge ***N***avigation, was developed by the United States during World War II. The current version of Loran, Loran-C, has been around since the late 1950's. The U.S. Coast Guard has operated Loran systems since their development, in order to meet United States national interests both nautically and internationally.

Although Loran-C is more commonly associated with maritime users, it has also been used by aircraft for many years. Technological advances are allowing for Loran-C to be used in many more applications than before. Significant growth in the size of the terrestrial, and civil aviation user communities are expected in the very near future. There are estimated to be over a half million Loran-C users worldwide. This includes about 80,000 Loran-C receivers already being used in aircraft. In response to civil aviation users needs, the Federal Aviation Administration (FAA), with Coast Guard assistance is incorporating Loran-C into the National Airspace System for supplemental enroute and non-precision approach purposes. Loran-C will allow the aviator to fly directly from one point to another and should permit easier location of small airports during poor weather conditions. Benefits of Loran-C use by the aviator include improved safety, time savings, and reduction of fuel costs.

In consonance with this FAA goal, the Mid-Continent Loran-C Expansion Project was established. The service provided under the project completes Loran-C coverage over the continental U.S., and provides radio navigation service to several thousand small airports that previously had none. It also improved coverage to the west of the Great Lakes, and provides improve maritime coverage to a part of the Gulf of Mexico. The project includes the formation of two new Loran-C chains , the North Central U.S. (NOCUS) Chain with a repetition interval of 82,900, and the South Central U.S. (SOCUS) Chain with a repetition interval of 96,100 microseconds, and the addition of one baseline to the Great Lakes Chain, repetition interval 89,700 microseconds. To form the new chains, four new Loran-C transmitting stations were constructed. They are located at Harve, MT, Gillette, WY, Boise City, OK, and Las Cruces, NM. It was also necessary to modify five existing stations to permit operating on the new rates as well as their present rates. These stations were Searchlight, NV, Baudette, MN, Grangeville, LA, Raymondville, TX, and Williams Lake, British Columbia, Canada. It was also necessary to construct five new monitor sites in the service area. The installation of additional equipment to two control sites at Middletown, CA, and Malone, FL, will allow these existing stations to control the two new chains.

Loran-C Coverage



Service from the SOCUS chain, less the Las Cruces, NM station started Christmas Day 1990. The Las Cruces station was added in April 1991 to complete the SOCUS chain. The NOCUS chain became operational in April 1991, along with the provision of additional coverage to the Great Lakes chain by the new Dana,IN - Boise City, OK baseline.

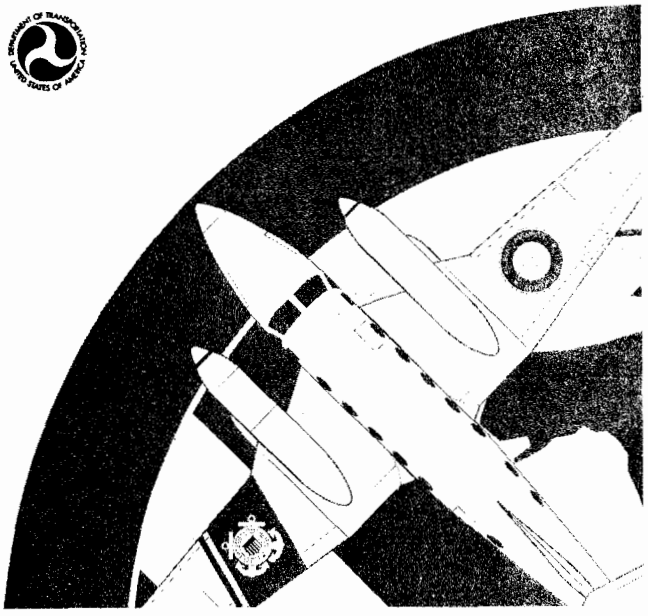
Completion of the Loran-C Mid-Continent Expansion Project is a major step to realizing the implementation of Loran-C into the National Air Space. This joint FAA/Coast Guard Project is an excellent example of the government at work to satisfy the needs of the user, promote commerce, and help ensure air safety in the National Air Space. The cooperative spirit displayed by both the FAA and the Coast Guard during this very major project, has resulted in a needed service that was provided on time, and within budget. Civil aviation users now be able to use Loran-C throughout the entire continental U.S. and a major part of Alaska.

Loran-C

Closing the Midcontinent Gap

Dedication Ceremonies

El Paso, Texas
May 14, 1991



DEDICATION CEREMONIES
El Paso International Airport
El Paso, Texas

May 14, 1991
10:00 A.M. MDT

PRESENTATION OF THE COLORS
6th Air Defense Artillery Brigade Color Guard
Fort Bliss, Texas

THE NATIONAL ANTHEM
62nd U.S. Army Band
Fort Bliss, Texas

INVOCATION
The Reverend Richard Blake
Pastor, Emanuel Baptist Church, El Paso, Texas

MISTRESS OF CEREMONIES
Suzanne Azar
Mayor, City of El Paso

REMARKS
Captain James F. Culbertson, USCG (Ret)
President, Wild Goose Association

Phil B. Boyer
President, Aircraft Owners and Pilots Association

Ray Rought
First Vice President, National Association of State Aviation Officials
Director of Minnesota Office of Aeronautics

Admiral Donald D. Engen, USN (Ret)
President, Aircraft Owners and Pilots Association Safety Foundation

Vice Admiral Martin H. Daniell, Jr.
Vice Commandant, United States Coast Guard

Barry Lambert Harris
Deputy Administrator, Federal Aviation Administration

CLOSING REMARKS

MESSAGE FOR US DEPARTAMENT OF TRANSPORTATION.
OFFICE OF THE SECRETARY OF TRANSPORTATION
ATTN: MR. JAMES B.BUSSY, ADMINISTRATOR FAA
FR: INTERNAVIGATION COMMITTEE, MOSCOW

DEAR MR. BUSSY

WE WOULD LIKE TO EXTEND OUR CONGRATULATION TO YOUR ADMINISTRATION ON COMPLETION AND DEDICATION OF THE NEW LORAN-C CHAINS AND THE CONSEQUENT CLOSING OF THE 'MID-CONTINENT LORAN-C GAP'.
IN OUR VIEW IT IS A SIGNIFICANT EFFORT WHICH PARALLELS OUR OWN TO ESTABLISH NEW LORAN-C / CHAYKA CHAINS TO SERVE RADIONAVIGATION REQUIREMENTS THROUGH THE USSR.
THE INAUGURATION CAN ALSO BE SEEN AS PART OF A LARGER PROCESS TO JOIN THE US LORAN - SOVIET CHAYKA SYSTEMS AND THE CLOSING OF THE GAP BETWEEN OUR CONTINENTS.
WE ARE SORRY THAT WE COULD NOT BE PRESENT AT THE DEDICATION.

V.I.DENISOV, DEPUTY CHAIRMAN OF INTERNAVIGATION COMMITTEE
NNNN

EXPANSION OF LORAN-C CLOSES THE MID-CONTINENT GAP

During dedication ceremonies in El Paso on May 14, the United States Department of Transportation marked completion of the nation's LORAN-C enroute navigation system.

The commissioning last month of a LORAN transmitter at Las Cruces, New Mexico, filled the mid-continent coverage gap.

Vice Commandant of the United States Coast Guard Vice Admiral Martin H. Daniell, Jr. and Federal Aviation Deputy Administrator Barry Lambert Harris were joined in El Paso by a host of national, state and local dignitaries on hand to celebrate this important event.

Admiral Daniell said, "This project is a real success story for the Department of Transportation. We've been working on the program for several years. LORAN-C was developed for maritime use by the Coast Guard and adapted for air navigation by the Federal Aviation Administration.

I'm pleased to note that our two departmental agencies worked long and hard with a high level of interagency cooperation and program innovation," he said.

"This project, known as the Mid-Continent Expansion Project, responds to the growing demand for random navigation service by the aviation community, particularly in low-altitude, remote and offshore areas not well served by other navigation systems," said Deputy Administrator Harris.

Mr. Harris said, "Developed for marine use, LORAN-C presently is being used by more than 100,000 pilots, primarily because of its low cost and area navigation coverage down to the surface, making LORAN-C especially attractive for general aviation and rotorcraft operation."

Deputy Administrator Harris noted the effort of the National Association of State Aviation Officials (NASAO) for their untiring effort toward seeing the LORAN-C project through to completion. Among numerous other aviation and aviation-related organizations contributing to the success of this project were the Aircraft Owners and Pilots Association and the Wild Goose Association, a group of LORAN manufacturers and users.

LORAN-C (LOng RAnge Navigation) is a self-contained, earth-based navigation system, consisting of widely separated ground-based transmitter chains and airborne receivers, that allows airplanes, ships, and even land vehicles to pinpoint their location reliably 24 hours a day in all weather conditions.

The powerful transmitters, a master and normally three secondary transmitters located many miles apart, form a chain identified by a four-digit number. The chains transmit time-dependent, low-frequency signals, which airborne receivers use to determine the aircraft position by comparing the time differences between the master and its secondary signals.

In order to complete the Mid-Continent Expansion Project, four new LORAN transmitter stations were commissioned by the U.S. Coast Guard at Havre, Montana; Gillette, Wyoming; Boise City, Oklahoma; and Las Cruces, New Mexico. FAA has modified the basically maritime system for aviation use.

With the so-called Mid-Continent Gap closed and the enroute system now in place, FAA will pursue certification of LORAN-C approaches: the next step in FAA's continuing commitment to meet the demands of the aviation community.

Going, going ...

Take a good look at the mid-continent gap, in this figure, from the Dedication Press Kit. This might be the last drawing we ever need to produce!

---------->

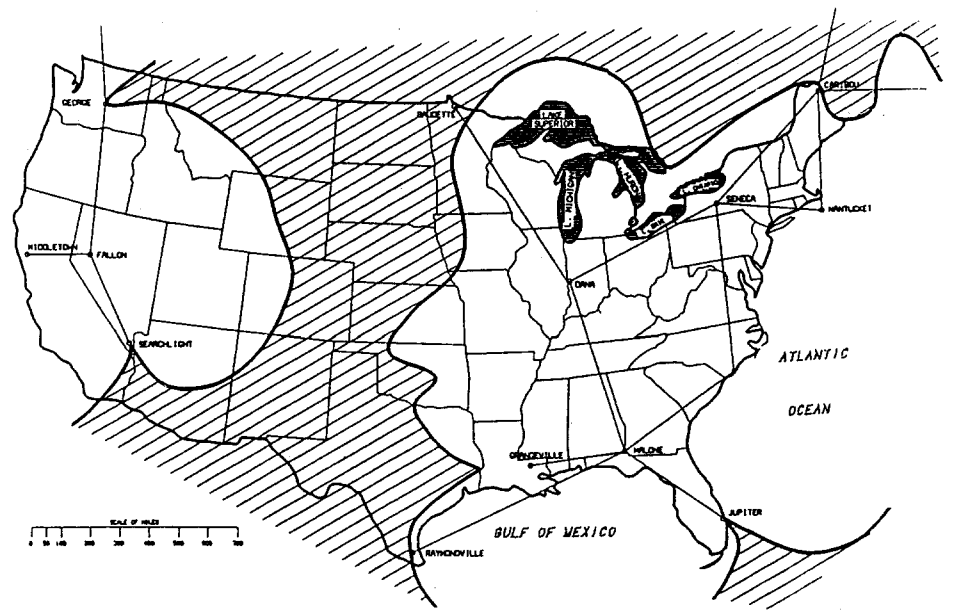


FIGURE 1: MIDCONTINENT LORAN-C GAP

El Paso Times

Tuesday, May 14, 1991 Price: 35 cents

New transmitter a boon to pilots

By David Sheppard
El Paso Times

Aviators from across the country will flip the switch on a new navigation transmitter today that, for the first time, will let small-plane pilots wing coast-to-coast literally as the crow flies.

The dedication at El Paso International Airport of the Loran—C transmitter honors the closing of a navigation gap that stretched more than 1,000 miles, from Arizona to Arkansas.

"For pilots, this is kind of equivalent to the golden spike ceremony at Promontory Point, Utah, that closed the continental railroad gap" in 1869, said Roger Myers, a Federal Aviation Administration spokesman.

Officials from the FAA, U.S Coast Guard and several aviation associations will be on hand to celebrate construction of the last Loran—C tower, which was built south of Las Cruces and recently began operating.

The tower completes a chain that allows pilots — using special receivers — to fly in a straight line to most destinations and avoid the circuitous network of airways that previously guided their crafts.

Pilots called the U.S. heartland the Bermuda Triangle — because the gap in Loran navigation signals often made them go hundreds of miles out of their way as they charted their course from airport to airport and other radio waypoints.

The triangle refers to an area in the Atlantic Ocean in which ships have reportedly vanished.

"It's a real cost-savings because pilots can now fly from point-to-point," Myers said. "Without Loran they sometimes have to go far out of their way."

The Loran system emits a low-frequency beacon that, like the signal from a radio station, can be received hundreds of miles away. Traditional general-aviation signals are confined to much smaller areas.

Loran stands for long-range navigation.

The system benefits general aviation pilots the most, Myers said, because it covers low altitudes and can be used with inexpensive receivers. Airlines long have been equipped with more sophisticated navigation aids to fly direct routes.

More than 100,000 aircraft — almost half of the general-aviation fleet in the United States — have Loran receivers. The Las Cruces transmitter was one of four new stations intalled to close the mid-continent gap.

The system was developed by the Coast Guard for maritime use and has been modified for aircraft by the FAA. Myers said the Coast Guard will operate the station.

The dedication is at 10 a.m. at the Oasis Hanger, 8111 Boeing, at El Paso International Airport.

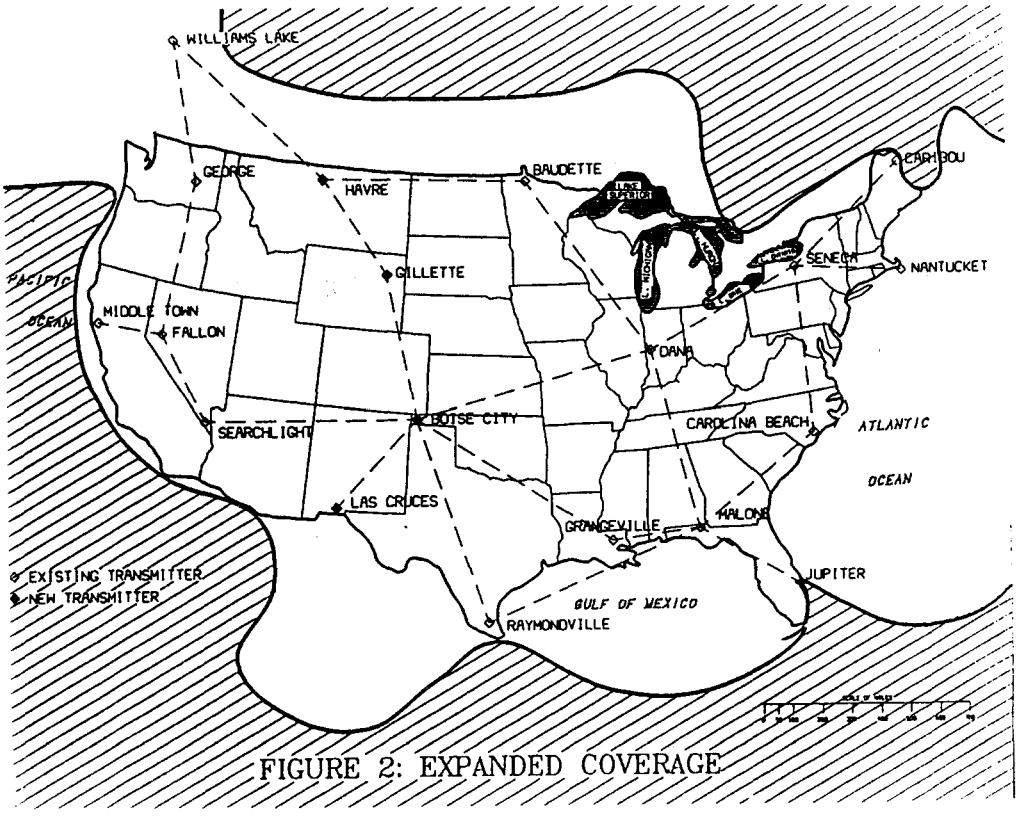


FIGURE 2: EXPANDED COVERAGE

Gone!

The Goose Gazette
Wild Goose Association
P. O. Box 556
Bedford, Massachusetts 01730

Bulk Rate
U.S. Postage
PAID
Permit No. 9
Athens, Ohio
45701