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WILD GOOSE ASSOCIATION

NEWSLETTER

SEPTEMBER 1978

ITEM Seventh Annual Technical Symposium will be held in New Orleans, LA during October 18 to 21. Anyone who has not received their registration and agenda information, or who want to make table reservations at the banquet, please contact Vern Johnson, ITT Avionics, 500 Washington Avenue, Nutley, New Jersey 07110. GOOD NEWS - If all goes well, financially, all members in good standing (at convention time) will receive a free copy of the proceedings. Additional copies will be available to members and non-members at a cost of \$10.00.

ITEM According to President-Elect Bahar Uttam, the following officers will serve you for the coming year:

Vice President - Vern Johnson, ITT
Secretary - Ray Abrazinskas, LSI
Treasurer - Carl Andren, Nav. Sys.

ITEM We understand that fellow honker Bob Frank has been running around the Detroit area spouting the technical merits of Loran to such as Communications/Aerospace and Electronic Systems Chapters and anyone else who will listen. Keep up the good work Bob!

Also, we see where R.W. Burhans has been publishing again. Papers under the title of "If You Want To Know Where You Are: Loran-C Receivers" in two parts has appeared in 73 magazine since the last newsletter. These papers should be of interest to anyone wishing to experiment with Loran. - R.W. Burhans, Dept. of Electrical Engineering, Ohio University, Athens, Ohio 45701.

ITEM The Tactical Loran System Program Office tested a balloon supported emergency antenna at Anniston, Ala. ~~this past June.~~ A wire antenna of 510 feet was held aloft by a 45000 cubic foot balloon flying at approximately 1000 feet. The antenna used four top loading elements which also serve as guys. This tripod type of tether allows the areodynamic balloon to wander in the extended cone of the guy wires without losing verticality of the antenna element. The new solid state transmitter manufactured by Sperry

Gyroscope, the AN/TRN-38, was able to deliver in excess of 20 kW of radiated power. Bill Rustenburg the local project officer says that with more ground radials and a little better matching that even more is achievable. The erection time for such a device is less than two hours and provides a useful backup in case the large antenna tower is lost due to severe weather or other catastrophic conditions. P.S. This transmitter radiates 30 to 35 kW from a standard 400 foot tower.

REPEAT ITEM Leo Fehlner would like to receive any nominations you may have for award recipients from the Wild Goose Association. If you know someone that you believe deserves such recognition, would you please send the name and the reasons why you think them deserving to Leo Fehlner, John Hopkins University, Applied Physics Lab, John Hopkins Road, Laurel, DC 20810.

REPEAT ITEM Advertising. The board of Directors has advised me that I am permitted to include advertising to help cover the cost of the newsletter. Our mailing list includes approximately 500 addresses. If you are interested we ask that they (500 copies) be one page (both sides permissible) 8-1/2 x 11 inches and folded in the center. A fifty dollar contribution for this distribution should accompany the advertisements. Send to L.D. Higginbotham, 4 Townsend Road, Acton, MA 01720. P.S. We will continue to announce new products as news items to the membership. Anyone who wishes to announce a new product please send a 6 to 10 line write-up.

ITEM NELCO, 7095 Milford Industrial Road of Baltimore, MD, 21208 announces the availability of a new receiver. Nelco Autofix 700, Dual C Automatic Loran for under \$3000.00. It features dual 6 digit readouts, a memory button to freeze position data, 4 notch filters (2 adjustable, 2 preset) and other status and monitoring displays.

ITEM From: J.P. Van Etten, Chairman
Loran-C Specification Committee
Subject: Committee Report, 13 June 1978

A specification package has been put together by the USCG. This is now in the final stages of review and will be transmitted to the Executive Committee for review action.

If appropriate, the Specification Committee will coordinate a distribution to all the membership for review and comment; the Committee will review, consolidate and summarize the members'

inputs and prepare WGA comments and recommendations to be transmitted to the Coast Guard.

Leo Fehlner is organizing a WGA panel discussion on the Loran-C Signal Specification. This panel discussion is planned for Friday afternoon at the Annual Convention in New Orleans in October.

ITEM The WGA continues to exert influence on the Federal Agencies responsible for navigation matters. WGA positions on critical issues, such as those following, "What is U.S. National Navigation Policy" and "Impact of Power Line Carrier Systems" follows with the latter being preliminary.

POSITION PAPER #78-1

CRITICAL ISSUE: WHAT IS U.S. NATIONAL NAVIGATION POLICY?

BACKGROUND:

Considerable confusion and concern arises due to a proliferation of documents, each of which claims to define or recommend U.S. policy with respect to National Navigation Systems. These documents are:

(1) "National Plan for Navigation" (NPN) - Primary and official source document, issued by Department of Transportation, for navigation policy and plans affecting civil transportation. It was first issued in 1970 and has recently been updated (November 1977). This document has been coordinated with the DOD, DOC and NASA.

The stated purpose of the NPN is the promulgation of a National Navigation Policy and the description of the action to be taken for its implementation. The NPN identifies the radio navigation aids which the Federal government recognizes as necessary to meet the current and future needs of non-military air, marine and land users; and the peacetime operational needs of military users of civil systems. The NPN deals comprehensively with the following radio navigation aids: Loran A, Loran C, Omega, Satellites, VOR/Tacan/DME, Non-Directional Beacons and Landing Systems. The NPN recognizes the potential for Navstar GPS, but does not include it in an operating plan because DOT concluded that it would be premature to formulate a plan predicated upon the availability of DOD's Navstar GPS for civil use.

(2) "Federal Radio Navigation System Plan" (FRNSP) - This document, issued by Office of Telecommunications Policy, is based upon an economic and planning analysis prepared by an outside contractor.

The FRNSP proposes that DOD's Navstar GPS should become the future civil/military common system for navigation and that navigation plans and programs should be designed in the future with this objective in mind. The FRNSP suggests that significant

savings would accrue over time to both the Federal Government and to users as existing "duplicatory" systems are phased out and reliance is placed increasingly on the capability of Navstar GPS. The FRNSP identifies 38 generic radio navigation systems used for current and planned military and civilian applications; it contends that 14 of these systems will adequately satisfy all known requirements. FRNSP states that such consolidation of radio navigation systems, with primary reliance of Navstar GPS, would achieve savings of the order of 20 billion dollars over the next 25 year period.

(3) "Navigation Planning - Need for a New Direction" - (GAO document LCD-77-109, dated 3/21/78). This document is a study report prepared by the U.S. General Accounting Office.

The GAO study claims there is substantial overlap among the 13 existing and planned radio navigation systems operated by the Federal Government. It further claims that Navstar GPS has the potential for meeting the needs of nearly all users, and that it should become the primary system with limited but essential back-up. The GAO Study states that 4 or 5 systems could suffice for navigation needs of all users, and recommends that spending be deferred on unneeded or potentially unneeded systems. It also recommends that a strong management focus be provided to plan and direct government-wide navigation matters.

PLANNED GOVERNMENTAL ACTION

Office of Management and Budget (OMB) has established an interagency working group to formulate a coordinated plan for a Federal Radio Navigation System and this plan is targeted for submission to the President for his review in the early fall of 1978. The working group is comprised of members from the following government departments and agencies: OMB, DOD, DOT, NTIA, NASA, MARAD, USCG, FAA. Following are some of the committee members:

- OMB: Walter Haase, Senior Executive
W. T. Adams, Co-chairman
- NTIA: D. Jansky, Co-chairman
- DOD: LCOL. Stephen Gilbert
- DOT: Capt. W. Mohin
R. Beam
- MARAD: C. S. Mathews

WGA POSITION

The Wild Goose Association favors the definitization and promulgation of a comprehensive and well-defined National Plan for Navigation. Such a plan must be realistic in all respects, technical, economic and schedule, if it is to be of benefit to the National interest. Further, once such a plan is approved, there must be an effective phased implementation. Otherwise, the effort might better not be attempted because of the inevitable negative effects that will accrue to presently planned navigation programs and the user communities.

The Wild Goose Association believes that operating plans should be based on fact, not expectations. Significant technical issues must be solved before committing any system to operational use. Potential capability should not be mistaken for capability; potential cost savings should not be projected as realistic cost savings unless the assumptions upon which the projections are made are prudent and conservative.

The Wild Goose Association believes that duplication or redundancy of navigation services is necessary and good; we also believe that unnecessary or excessive proliferation of navigation services is wasteful and harmful to the national interest. It is the responsibility of the Federal Government to make an intelligent judgment as to what proliferation is necessary and good and what proliferation is unnecessary and wasteful. The OMB interagency committee should be charged with objectively making these broad determinations. These determinations must also be established or projected clearly in the context of a time-phased implementation plan, including well-defined and documented funding and responsibility recommendations.

Specifically, the WGA considers that the following radio navigation systems are essential to the National interest now and for the foreseeable future:

VOR/Tacan /DME
Loran-C
Omega
NDB

After Navstar GPS becomes fully operational, and its capability has been demonstrated and evaluated, a new review of the need for these systems should be undertaken to reassess their operational need from the standpoint of cost-effectiveness and redundancy.

It is quite probable that these systems will remain cost effective and necessary even after Navstar GPS becomes operational. Certainly, there will need to be an extended transition period before any of these operational systems are "turned off".

The Wild Goose Association concurs with the need for a strong management focus to plan and direct government-wide navigation matters. However, we also recognize the different objectives and requirements of civil and military navigation systems. Common systems are in the national interest only when prime objectives of civil and military application are not significantly compromised for the sake of commonality. Therefore, it seems essential that there be two strong management focal points - one for all civil navigation systems, and one for all military navigation systems. The Wild Goose Association suggests that the chief executive for military navigation systems report to the Secretary of Defense and the chief executive for civil navigation systems report to the Secretary of Transportation.

PRELIMINARY

POSITION PAPER 78-2

CRITICAL ISSUE: IMPACT OF POWER LINE CARRIER SYSTEMS

BACKGROUND

For many years now, Loran-C performance has been adversely affected in the vicinity of power lines; and such degradation in performance has been attributed to Loran-C pickup and re-radiation from the power lines.

There is now considerable evidence that these effects are not due to Loran-C pickup and reradiation, but rather are caused by power line carrier radiation.

For some time, power line carrier systems have been utilized by power utilities for protection, control and supervision of the power system. (1) Power line carrier systems have been favored over other communication media because of its inherent reliability and low cost in applications where only a few communications channels are required. Carrier frequencies between 30 and 200 KHz are generally employed with heavy use concentration near 100 KHz.

The "radiated" field strength has been measured and is found to be inversely proportional to distance from the power line, for distances of 0.1 miles to 30 miles. (1) For a typical 100-watt carrier system, the field one mile from the power line has been measured to be about 55 db above 1 uv/m. (1)

In recent years, interest is growing in application of load-management techniques to electric-utility systems. (2, 3, 4) Techniques of load-management include: (1) watt-hour meters with clock-activated control, (2) radio control, (3) ripple control (introduction of an audio signal into power distribution network for control), (4) high frequency (e.g., 50-100 KHz) two-way distribution power-line carrier communication system, (5) telephone line systems. By use of the fourth technique,

with a transmitter at the consumer end, two-way communications is provided and a large amount of versatility is added to the system. This versatility takes the form of automatic meter reading, same day utility system billing, etc., load management, and preventive maintenance capability. Therefore, many utility management experts (2, 4) believe that the two-way distribution power line carrier communications system provides the most versatile and flexible system for implementing load management, multi-rate pricing and automatic meter reading.

Several projects are underway under the auspices of the U.S. Department of Energy (DOE) and the Electric Power Research Institute (EPRI) to implement and test two-way power-line carrier communications systems. Increased use of carrier communications systems on power-lines can be anticipated in the future; unfortunately such increased use will bring increased radio interference to services (such as Loran-C), operating in the frequency band utilized.

It is indeed ironic that these power-line carrier systems, which cause so much interference to authorized radio systems such as Loran-C, are unregulated by the Federal Communications Commission (FCC).

WGA POSITION

The Wild Goose Association believes that power-line carrier systems should be regulated by the Federal Communications Commission (FCC) to insure that authorized radio services are properly protected.

REFERENCES

- (1) "Power Line Carrier Radiation from High Voltage Lines", by D. E. Jones, Ontario Hydro Research Quarterly, 3rd Quarter, 1965.
- (2) "EPRI Looks Inward and Ahead", IEEE Spectrum, February 1978.
- (3) "A Step in Load Management Strategy Development", by Stanley A. Trumbower, Public Utilities Fortnightly, June 17, 1976.
- (4) "The Technology for Load Management Rate Structures" by Don W. Miller and Mark S. Gerber, Public Utilities Fortnightly, June 3, 1976.

