

BOARD OF DIRECTORS

W. N. DEAN *President*
J. F. CULBERTSON *Vice President*
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J. P. Van ETTEN



Exhibit 1

WILD GOOSE ASSOCIATION

March 24, 1986

TO: WGA Directors and Committee Chairmen

FROM: WGA President

SUBJECT: 72nd Meeting of the Board of Directors

The next meeting of the Board of Directors will be held Wednesday, April 16, 1986, at 9:30 AM in Conference Room 8440, Nassif Building, 400 Seventh Street, S.W., Washington, DC.

AGENDA

- 1. Call to Order
- 2. Secretary's Report
- 3. Treasurer's Report
- 4. Standing Committee Reports
 - a. Constitution Johnson
 - 1. European Section Status
 - b. Conventions
 - 1. 1984 Convention Report Sartin
 - 2. 1985 Convention Report Illgen
 - 3. 1986 Convention Report Marchal
 - 4. 1987 Convention Report Toms
 - c. Journal Culbertson
 - d. Membership Toms
 - e. Newsletter Miller
 - f. Nominations Van Etten
 - g. Congressional McGann
 - h. Awards Frank
 - i. Federal Radionavigation Plan Van Etten
- 5. New Business
- 6. Establish Next Meeting Date

brochures, which have to be sent from the participating sponsors to this office.

4. To get the full attention of the recipient we will send as first class mail and not as printed matter (going into the waste basket) If the funds of the sponsorship are not fully needed for this campaign it will serve for the next promotion activity or WGA constitution meeting.

The originally planned June date seems to be too early in respect of organizing and a sufficient amount of test results of the chain 894. Therefore we propose September in Normandie two days prior to the Brighton Institute of Navigation Symposium.

Participating sponsors of the proposed companies should by Air Express International ship their brochures they want to have distributed until

10th of May 1986

as well as their contribution of \$ 640,-.

Please act immediately in contacting each other. Copies have been sent at the same time to the abovementioned companies.

Any further companies willing to participate are welcome.

Sincerely Yours,

J.H.Böttcher
J.H. Böttcher

This letter and the draft has been approved by

J.H.Böttcher

Adrian de Bruine

Dr.van Willigen, University Delft

Professor Grimm, University Siegen

Brian Grant, England

D R A F T

DEAR SIR/ MADAM,

ALL THOSE THAT NAVIGATE DO NEED TO KNOW WHERE THEY ARE. AND THAT DOES NOT ONLY APPLY TO SEAFARING AND AIRBORNE PEOPLE. A GROWING NUMBER OF LANDBASED APPLICATIONS IN THE FIELD OF AMBULANCE FLEETS, FOREST FIRE FIGHTING ETC. PROVES THAT.

CENTRAL IN ALL APPLICATIONS IS THE NEED TO HAVE A MULTI ACCESS, FREE LOW COST AND RELIABLE SYSTEM, WHICH DOES NOT DEPEND IN ANY WAY ON ONE ORGANIZATION ONLY, ONE COUNTRY OR PURE COMMERCIAL INTEREST.

AMONGST THEM LORAN-C IS A SURPRISINGLY LIFE SYSTEM. AN EARTH-BOUND SYSTEM THAT STILL GROWS IN GEOGRAPHICAL SPREAD AND USE IN A SATELLITE-MINDED WORLD MUST HAVE SOMETHING!

ALSO EUROPE STANDS AT THE BRINK OF ITS FULL IMPLEMENTATION.

TWO NEW HIGH POWERED STATIONS IN FRANCE BECAME OPERATIONAL IN JUNE 1985. TOGETHER WITH THE EXISTING US STATIONS THIS WILL ENABLE A CONSIDERABLE EXPANSION OF COVERAGE OVER EUROPE.

IN THE PARENT COUNTRY OF THE SYSTEM, THE USA, LORAN-C IS FOSTERED BY THE WILD GOOSE ASSOCIATION.

THE PURPOSE OF THE WILD GOOSE ASSOCIATION

The WGA is a professional organization of individuals and organizations having an interest in Loran (long-range navigation). It is named after the majestic birds that navigate thousands of miles with unerring accuracy. The WGA was organized in 1972, and its membership now includes hundreds of professional engineers, program managers, scientists, and operational personnel from all segments of government, industry, and other user community throughout the world, working for the advancement of Loran.

THE WGA HAS ALREADY SEVERAL MEMBERS DOMESTIC IN EUROPE, WHICH SOME READERS WILL READILY CONFIRM.

WE STILL THINK THERE IS SCOPE FOR A EUROPEAN BRANCH OF THE WGA TO COPE WITH THE SPECIAL PROBLEMS ROUND THE INTRODUCTION OF THE SYSTEM HERE.

ONE SIMPLE REASON CONSISTS OF THE DISTANCE PROBLEM USA - EUROPE. FURTHER THE STATE OF DEVELOPMENT ON BOTH SIDES OF THE OCEAN IS SO TOTALLY DIFFERENT.

WE THEREFORE ASK YOU TO AIR YOUR VIEWS ON THE INSTITUTION OF SUCH A BRANCH, TO WHICH PURPOSE WE PROPOSE TO HOLD AN INAUGURAL MEETING THIS YEAR. (DATE PRIOR TO BRIGHTON?)

1986 WILL BE A VERY IMPORTANT YEAR FOR LORAN-C AND EUROPE.

DURING SUMMER 86 AN OFFICIAL TRY-OUT PERIOD WILL BE HELD WITH THE EXPANDED FRENCH INITIATED W-EUROPEAN CHAIN IN ADDING USCG "SYLT"(BRD) IN "DUAL-RATE" MODE.

FURTHERMORE NORWAY IS DECIDING TO TAKE OVER THE USCG STATIONS AT JAN MAYEN AND Bø; AFTER RENEWAL AND EXPANSION WITH TWO MORE STATIONS NORWAY WILL ADOPT LORAN-C AS THEIR FUTURE NATIONAL SYSTEM TO SUCCESS DECCA NAVIGATOR.

LORAN-C IS NOT MEANT AS A COMPETITOR TO OTHER SYSTEMS LIKE GPS OR DECCA. HOWEVER THE DATE OF FULL OPERATIONAL USE OF THE FORMER IS STILL NOT KNOWN PRECISELY AND THE SAME APPLIES TO ACCESS TO THE ACCURATE MODE, COMPARABLE IN REPEATABLE ACCURACY AS ATTAINABLE WITH LORAN-C. IN COMPARISON WITH DECCA NAVIGATOR ITS RANGE IS SUBSTANTIAL BETTER AND IS NOT BESET WITH THE WELL-KNOWN POLITICAL PROBLEMS AND FRUSTRATIONS. LORAN-C CAN NO DOUBT ALWAYS SERVE ASA RUGGED BACK-UP AND REDUNDANT FOR ANY EXISTING NAVIGATION SYSTEM.

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W. L. POLHEMUS
W. SCHORR
J. P. Van ETEN

Exhibit 3



WILD GOOSE ASSOCIATION

118 Quaint Acres Drive
Silver Spring, MD 20904

March 24, 1986

Wu Hua-jun
RACAL-Megapulse, Inc.
8 Preston Court
Bedford, MA 01730

Dear Mr. Wu,

I was very pleased to meet you and your associates at the dinner meeting of 13 March 1986. As we discussed during the meeting, this letter will explain the types of WGA membership. There are three types:

1. Regular Membership
2. Associate Membership
3. Corporate Membership

1. REGULAR

Only individual persons can be regular members. These persons can be citizens of any country. To join the WGA, a person must fill out an application form for individual membership (Enclosure 1) and pay \$15.00. Dues for each year after the first is currently \$12.00. All members receive the WGA Journal, the Annual Proceedings of the Technical Symposium and the Newsletter. The technical symposium is held at the annual convention which is usually scheduled in October. Members and non-members who attend the convention pay for their own convention expenses. There is an election of President and one-third of the Directors every year. Every member may cast one vote for President and one vote for each of four Directors. Members may serve on committees and also serve as chairman of committees when appointed by the President.

2. ASSOCIATE

Organizations which want to receive WGA publications may apply for Associate Membership. These organizations receive all of the publications

sent to Regular Members, but are not extended any other privileges. Organizations in any country may join by filling out an application form for Organizations Membership and paying \$30.00. Dues after the first year is currently \$25.00.

3. CORPORATE

There are two classes of corporate membership. Profit-making corporations that have more than 500 employees are only eligible for Class 1 membership. All other organizations are eligible for Class 2 membership, but may elect to be Class 1 Corporate Members if they so choose. Class 1 Corporate Members may select 10 employees of the company to be Regular Members at no additional cost. Class 2 Corporate Members may select 5 employees to be Regular Members at no additional cost. Corporations in any country may become members by filling out the application for organization membership (Enclosure 2) and paying \$220.00 for Class 1 membership and \$110.00 for Class 2 membership. After the first year, annual dues is currently \$200.00 for Class 1 and \$100.00 for Class 2. See the reverse side of Enclosure 2 for exact definitions of organization membership.

The WGA expects all fees to be paid in U.S. dollars.

The WGA also has procedures for chartering WGA Chapters in regions of the world where there are enough Regular Members living close enough together to meet locally for social activity and exchange of information. Some time later, when you feel that such conditions have been met, you may want to consider establishing a chapter. At that time we can discuss the procedures for a charter.

Soon I will send you a number of reprints of recent papers on Ioran and I hope these will be useful to you and your associates. We will be very pleased if some of the Ioran experts from China join our Association.

Very truly yours,



Leo F. Fehlner
Secretary

LFF:jp

Enclosures (2)

Copy (w/o encl.) to:

- W. N. Dean
- J. F. Culbertson
- L. F. Fehlner
- D. A. Carter
- V. L. Johnson
- J. L. Toms
- E. L. McGann
- C. S. Andren

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Exhibit 4

WILD GOOSE ASSOCIATION

TREASURER'S REPORT

April 16, 1986

Balance from January 20, 1986 \$16,561.16

TRANSACTIONS

RECEIPTS

Dues	2072.50	
Journal Sales	30.00	
Journal Ads	780.00	
	<u>2882.50</u>	18533.66

EXPENDITURES

Foreign Check Charges	11.53	
Business cards	163.61	
Dues refund	26.00	
Treasurer expenses	33.00	
PO Box rent (Bedford)	29.00	
	<u>263.14</u>	18,270.52

WGA Account balance as of April 16, 1986 \$18,270.52

Submitted:

Approved: Date Apr 16 1986
Board of Directors

David A. Carter, Treasurer

Walter N. Dean, President

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W. N. DEAN
L. D. HIGGINBOTHAM
J. D. ILLGEN
V. L. JOHNSON
A. W. MARCHAL
J. P. VAN ETTEN
V. I. WEIHE



Exhibit 5

WILD GOOSE ASSOCIATION

29 April 1985

Mr. J. H. Böttcher
Schiffbrücke 27
D-2390 Flensburg
Federal Republic of Germany

Dear Mr. Böttcher:

Your letter to Carl Andren regarding actions toward the formation of a WGA chapter in Europe has been referred to me for coordination with you of the necessary actions.

This matter was considered by the Board of Directors at the meeting of 9 April 1985. The Board welcomes this interest and encourages the actions toward formation of a Regional Club in Europe.

Provisions governing the formation of Regional Clubs are contained in the WGA Constitution, Article XIV and the By-Laws, Article XII. The current WGA Constitution and By-Laws are published in the WGA Radionavigation Journal 1984 and have been extracted and enclosed herewith for your convenient reference. You will observe that it is necessary to organize the local club and to draft a Constitution and By-Laws for the local club, after which application should be made to the Association for a charter. Copies of the Constitution and By-Laws that were drafted by the New England and Southeast Chapters, together with copies of the application and correspondence with the Association, are included herewith for your information and guidance.

Please advise if more information should be required. My telephone number is (201) 284-2421. Correspondence should be addressed to me at ITT Avionics, 500 Washington Avenue, Nutley, New Jersey 07110.

Best regards,

A handwritten signature in black ink, appearing to read "Vern", written over a horizontal line.

Vern Johnson
Chairman,
Constitution Committee

Enclosures:

- 1) WGA Constitution and By-Laws
- 2) Southeast Chapter Constitution and By-Laws and associated correspondence
- 3) New England Chapter Constitution and By-Laws and associated correspondence

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E. L. McGANN
W. L. POLHEMUS
W. SCHORR
J. P. Van ETTEN



Exhibit 6

WILD GOOSE ASSOCIATION

March 24, 1986

William Jones
Braderuper Weg
2285 Kampen/Sylt
West Germany

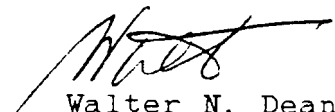
Dear Bill,

I have had some conversation and correspondence with Heino Bottcher concerning the European Chapter of the Wild Goose Association. Heino can't seem to realize that we can't recognize a Chapter until a few formalities are taken care of, such as making an application, for which we have sent him all the papers. He has apparently appointed you Secretary, according to his latest letter, so maybe you could undertake some of these things.

According to his latest letter, Heino seems to be planning an ambitious convention on very little notice, and before we lend the WGA name to such an undertaking, we would like to see evidence of better planning. We would appreciate it if you could help provide some of that assurance.

The Sylt dual-rating can provide a real impetus for Ioran in Europe. We hope it will develop into a really useful system there, and a WGA Chapter can really help, if it is well organized. We back here are anxious to help. Please see if you can get a little more formality into the European Chapter.

Sincerely,


Walter N. Dean
President

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- J. P. Van ETTEN

Exhibit 7



**WILD GOOSE ASSOCIATION
CALL FOR PAPERS**

**15TH Annual
LORAN-C TECHNICAL SYMPOSIUM
October 22-24, 1986
New Orleans, Louisiana**

THEME - THE QUIET EXPANSION

LORAN-C is on a roll!!! Authors are invited to submit a one page abstract to the technical chairman for papers on listed or other topics in the following areas:

General

- Federal Radionavigation Hearings
- Coast Guard systems update
- FAA plans and status
- DOD system use
- LORAN-C protection criteria
- Mid-Continent expansion

International System

- Loran-C expansion in China
- Saudi Chain Performance
- LORSTA Sylt Double-Rating Tests
- European Loran Planning update
- Mini-chain deployment and use
- Canadian Expansion Considerations

Coast Guard Related

- Pt. Clarence Double Rating
- ROS revisited
- Operations changes related to Aviation
- Chesapeake Bay survey
- A-76 Status
- Loran-C Signal Specification upgrade
- Transmitter replacement program

Aviation Related

- Pilot monitor program
- Loran-C MOPS (RTCA 137A)
- NPA accuracy requirements (AC-9045A)
- Airport certification status for NPA
- FAA monitor procurement
- CONUS overflight data analysis

General System Considerations

- DMA plans for ASF data update /distribution
- Chart Update (NAD-27 to NAD-82)
- Gulf of Maine Calibration Results
- Loran-C Receiver Architecture
- Marine Navigator MOPS
- Canadian East Coast Chain(5930) calibration

Land Applications

- Users reports on operational systems
- System designs
- Performance versus promise
- Michigan AVM study
- Fleet operations

Paper Schedule

- | | |
|---------------------------------|--------------------|
| Abstracts to Technical Chairman | June 1, 1986 |
| Acceptance/Instructions | July 1, 1986 |
| Papers to Technical Chairman | September 1, 1986* |

General Chairman

Bill Marchal
c/o Offshore Navigation Inc.
P.O. Box 23504
New Orleans, LA 70123
(504) 733-6790

Technical Chairman

Francis W. Mooney
Two Surf Street
Marblehead, MA 01945
(617)-631-6585(h),494-2122(w)

*This is a key date because proceedings will be issued at the conference

Exhibit 8

Membership Committee Report

The following is the inventory of WGA publications currently in the custody of the Membership Committee. 1984 Proceedings are urgently needed to fill orders we are currently holding.

DATED: April 28, 1986

DATE	ORIGINALLY	<u>JOURNALS</u>	
		SHIPPED OUT	REMAINING
1975	0	ANI *TRADED/GAVE 1	1
1977	14	2	12
1978	28	2	26
1979	66	2	64
1980/1981	61	5	56
1982	6	3	2
1983	1	1 ANI TRADED/GAVE 4	4
1984	110	37	73

DATE	ORIGINALLY RECEIVED	<u>PROCEEDINGS</u>	
		SHIPPED OUT	REMAINING
1977	0		
1978	14	5 ANI TOOK 1 IN TRADE	9
1979	24	3 ANI TOOK 1 IN TRADE	21
1980	54	3 ANI TOOK 1 IN TRADE	51
1981	24	3 ANI TOOK 1 IN TRADE	21
1982	48	3 ANI TOOK 1 IN TRADE	45
1983	85	2	83
1984	1	1	0

*Note: ANI traded 5 Journals from ANI stock for 5 Proceedings to satisfy demand for Journals.

LORAN-C SYSTEM CHARACTERISTICS--HAVE A QTY. OF 6.

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J. P. Van ETTEN

Exhibit 9



WILD GOOSE ASSOCIATION

April 15, 1986

To: Mr. W. N. Dean, President
Wild Goose Association

Subject: Nominations for President and Directors

The Nomination Committee of the WGA, consisting of John Buekers, Jim Culbertson, Charlie Kenney, Ed McGann, and Jim Van Etten, Chairman, nominate the following members of the WGA to run for President and Directors:

President -- Walter N. Dean
John D. Illgen

Directors -- *James O. Alexander
Carl S. Andren
*David A. Carter
*James F. Culbertson
John D. Illgen
James R. McCullough
~~George Quinn~~
Jimmie L. Toms

* Directors seeking reelection

All of the above candidates have been contacted and, if elected, are willing to serve.



J. P. Van Etten

Chairman, Nominations & Election Committee

cc: Committee members

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A. W. MARCIAL
E. L. McGANN
W. L. POLHEMUS
W. SCHORR
J. P. Van ETTEN

Exhibit 10



WILD GOOSE ASSOCIATION

April 22, 1986

To: Mr. W. N. Dean, President
Wild Goose Association

Subject: Nominations for President and Directors

The Nomination Committee of the WGA, consisting of John Buekers, Jim Culbertson, Charlie Kenney, Ed McGann, and Jim Van Etten, Chairman, nominate the following members of the WGA to run for President and Directors:

President -- Walter N. Dean
John D. Illgen

Directors -- *James O. Alexander
Carl S. Andren
*David A. Carter
*James F. Culbertson
John D. Illgen
James R. McCullough
M. J. Moroney
William F. O'Halloran
Jimmie L. Toms

* Directors seeking reelection

This slate of candidates was approved by the Board of Directors at their meeting in Washington, D.C., April 16, 1986. All of the above candidates have been contacted and, if elected, are willing to serve.

A handwritten signature in black ink, appearing to read "J. P. Van Etten", is written over a horizontal line.

J. P. Van Etten
Chairman, Nominations & Election Committee

cc: Directors
Nominees
Committee members

BOARD OF DIRECTORS

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W. L. POLHEMUS
W. SCHORR
J. P. Van ETTEN

Exhibit 11



WILD GOOSE ASSOCIATION

April 9, 1986

TO: WGA Directors

FROM: J. P. Van Etten, Chairman
Ad hoc Committee on FRP

SUBJECT: Draft Comments on FEDERAL RADIONAVIGATION PLAN

Enclosed is a draft of comments by the ad hoc committee appointed by Walt Dean to review and comment on the FEDERAL RADIONAVIGATION PLAN, 1984.

Discussion of this subject is scheduled at the Board of Directors meeting in Washington on April 16th as agenda item 4i.

DRAFT STATEMENT

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D. SPECIFIC COMMENTS ON THE 1984 FRP.....	7
E. RECOMMENDATIONS RE THE FRP.....	8
F. SUMMARY OF KEY ISSUES.....	9



prepared by

Ad hoc Committee
WILD GOOSE ASSOCIATION

April, 1986

A. KEY STATEMENTS FROM THE FRP

<u>Page</u>	<u>Reference Statement</u>
Letter, vii	FRP is the official source of navigation policy and planning for the Departments of Defense and Transportation.
vii	FRP incorporates common user (civil/military) radionavigation systems covered in DOD's JCS Master Navigation Plan (MPN).
viii	This edition of the FRP contains the preliminary joint DOD/DOT recommendation on the future radionavigation systems mix. A significant portion of this plan is devoted to GPS since it has the potential to replace many existing radionavigation systems.
I-1	Purpose of the FRP is defined.
I-4	The objectives of United States Government Radionavigation Policy are to: A. Promote efficient transportation services. B. Promote national security by providing necessary services. C. Promote safety of travel.
I-4, I-5	18 Policies and Practices are defined. Note particularly, policies N, P, Q. N. Make the GPS Standard Positioning Service (SPS) continuously available worldwide for civil, commercial and other use at the highest level of accuracy consistent with U.S. national security interests. . . . Civil users are cautioned that the system is developmental and signal availability and accuracy are subject to change without advance warning at the discretion of the Department of Defense. Therefore, until the system is declared operational, any use of the system is at the user's own risk. P. Require, where practical, users of Federally created radio aids to navigation and services to bear their fair share of the costs for development, procurement, operation, and maintenance of these systems insofar as technically and economically feasible. Q. Provide, through DOD/DOT interagency agreements, comprehensive management for all government provided common use radionavigation systems.

REVIEW OF & COMMENTS ON "FEDERAL RADIONAVIGATION PLAN, 1984"

A. KEY STATEMENTS FROM THE FRP: (continued)

Page Reference Statement

I-7 thru DOD/DOT POLICY FOR THE FUTURE RADIONAVIGATION SYSTEMS MIX
I-10 (Important to read entire policy statement)
 Excerpts:

When a decision is made to terminate a navigation system, an appropriate transition period will be provided.

PHASE OUT OF EXISTING SYSTEMS: It is the goal of the DOD to phase out use of TACAN, VOR/DME, OMEGA, LORAN-C and TRANSIT in military aircraft and other platforms. Civil user phase out of LORAN-C and OMEGA would be keyed to (a) resolution of GPS accuracy, coverage, integrity, and financial issues; (b) GPS meeting civil air, marine, and land needs currently met by LORAN-C and OMEGA; (c) GPS civil user equipment being available at prices that would be economically acceptable to LORAN-C and OMEGA users; (d) a transition period of 15 years; and (e) resolution of international commitments in the case of LORAN-C and OMEGA.

I-19 LIAISON WITH THE PRIVATE SECTOR

Interested parties and advisory groups from the private sector are invited to submit their inputs to the Chairman of the DOT Navigation Working Group (Attn: DMA-26), Department of Transportation, Research and Special Programs Administration, Washington, DC 20590.

I-29 Operating Plan for LORAN-C System calls for a Final DOD/DOT Policy Recommendation on Future Systems in 1986, and a National Decision on LORAN-C in 1987.

I-33 Ditto for OMEGA

I-36 Ditto for VOR, VOR/DME

I-56 Ditto for GPS

I-59 SELECTION OF INITIAL RADIONAVIGATION SYSTEMS MIX calls for DOD/DOT Final Recommendation on Selection of Navigation Systems of the Future in 1986 and National Decision on Selection of Navigation Systems of the Future in 1987.

I-58 thru Criteria and Methodology for SELECTING RADIONAVIGATION
I-68 SYSTEMS TO BE USED IN THE FUTURE are described on these pages. Presumably this has been an ongoing activity since 1984; results of the process are not known.

B. GENERAL COMMENTS RE THE FRP PROCESS:

1. The authors of the FRP must recognize that the FRP is becoming a model for similar documents in other nations. Therefore, it is imperative that the document very clearly define its purpose, contents and terms of reference in unambiguous terms.

Since the FRP document is said to be the reference as to what U.S. radionavigation policy is at any given time, then major policy decisions involving this policy must only become effective with the issuance of a new edition of the FRP. (Decisions made between editions leave the national and international communities confused as to what the U.S. policy is at any given time. Also, no government employee should represent U.S. policy as being anything except that which is strictly represented in the current issue of the plan.)

2. The FRP must be explicit as to what the current approved radionavigation systems are in terms of what user requirements they meet, what national and/or international regulations or agreements are concerned, what is the guaranteed system lifetime, what is the agency in the U.S. government responsible, and by which system the current one might be replaced, and when.

Before a new system can even become a candidate to replace another, it must have reached the stage of maturity where all aspects of its operational deployment can be ascertained. These aspects include a realistic possible deployment schedule, technical performance projections; and the development/production/deployment and logistics support costs of the system and related user equipments. National and international regulatory implications must also be considered.

After a system becomes a validated candidate to replace another, the points of comparison between the candidates must be defined at predetermined times and according to prescribed criteria. If a candidate system is found to have the desired characteristics so as to replace an existing one, then a firm decision should be made and a switchover schedule established.

The formal progression of any system from development, to a replacement candidate, to an approved system must be chronicled in formal terms in successive issues of the FRP. The projected schedule of progression for each system must be clearly presented in each issue of the FRP along with a detailed explanation and portrayal of the steps and procedures that must be undergone in moving from one stage to another, including criteria of judgement that will be applied and the agency and the specific office within that agency that is responsible for each action.

C. GENERAL COMMENTS ON THE 1984 FRP:

1. The 1984 FRP is completely distorted by the presentation regarding GPS. In spite of an absolute absence of details regarding the potential acceptability of GPS as a national or international civilian aid-to-navigation system, it is presented as the probable or even certain, not just possible, replacement for all systems.

In the 1982-84 time frame when the current FRP issue was being produced, the imposed emplacement of GPS suppressed consideration of technical, economic and political issues regarding GPS.

Even today, there is little if any factual and creditable information regarding the issues related to the "civilization" of GPS.

- o What is the yearly operating cost of GPS compared to all other systems it is proposed to replace?
- o How does the replacement of all other systems by GPS benefit the U.S. public and taxpayer?
- o Who will bear the cost of GPS after the DOD ceases to use the system?
- o Will GPS meet the requirements of the U.S. user population? i.e., repeatability for fishermen; robustness/availability for non-precision aviation approaches.
- o What are the international liability and legal implications of providing GPS to the world?
- o What compromise/potential compromise to national security is imposed by civilization of GPS?
- o How does the worldwide availability of GPS signals supported by the U.S. taxpayer adversely affect commercial sales internationally? Won't GPS equipments be manufactured abroad? Won't sales of U.S. manufactured VOR/DME, TACAN, radar and Loran-C equipments be adversely and prematurely affected, thus adversely affecting the U.S. import/export balance of trade?

Considering the lack of information on the above issues, and others unlisted, it is incomprehensible how GPS could have been proposed even as a candidate system in 1984, or for that matter, anytime prior to full DOD operational status.

2. Out of nowhere and with no commitment by the U.S. government to GPS as even one of its national official civil radionavigation systems (even though it is presented in th 1984 FRP as the probable successor to everything) U.S. government officials offered GPS to the international aviation community through ICAO. This offer was made

B. GENERAL COMMENTS ON THE FRP: (continued)

even though the U.S. had not officially accepted GPS for any role in its official mix of systems. Equally important a review of ICAO (and incidently IMO) organizational constraints indicate that any system operated by the military of any country is unacceptable by these international organizations as a standard to be accepted by the organization member nations. How such a vague offer of GPS to the world could be made without considering the interests of the U.S. taxpayer, the valid term of the offer, or the responsible U.S. government agency that could guarantee funding for system operation and system operational parameters is incomprehensible.

3. No consideration in the 1984 FRP involves the supplementation of VOR/DME by Loran-C for aviation interests, with or without consideration of GPS.

4. The recent shuttle tragedy clearly illustrates that no planning had been given to long term support of the GPS system. Will the U.S. support the shuttle for 20-40 years? If not, what is the backup? (At present Block II GPS satellites cannot be launched by any other means). Does GPS have shuttle launch priority? How quickly can even the 18 satellite configuration be corrected for satellite failures by spare satellite movement and replenishment?

5. No estimate of cost-to-the-user in a possible transition between VOR/DME/LORAN-C to GPS has been addressed in formulation of the FRP and therefore any decisions are definitely premature.

6. Activities by U.S. government personnel in support of their own systems, have at taxpayer's expense adversely affected U.S. overseas and domestic product sales. It is unconsonable that an USAF colonel give presentations which project GPS as being here tomorrow -- which is patently untrue. Such information confuses prospective customers of navigation systems and therefore adversely affects the sales of commercial equipment manufactured in-country and abroad.

D. SPECIFIC COMMENTS RE THE 1984 FRP:

1. Page I-28: The discussion of the Canadian Loran-C stations omits the Cape Race station. Saudi Arabia has 7 stations, not 6.
2. Page I-30: The number of marine and aircraft users of Loran-C are underestimated by about 10,000 in each category.
3. Page I-48: The number of TRANSIT civil users (maritime) in the chart does not correlate with paragraph 4.3.6.B, page I-46.

E. RECOMMENDATIONS RE THE FRP:

1. Set the schedule of issuance of the FRP to coincide with U.S. national policy decisions.
2. Augment the FRP preparation staff, funding and the preparation agenda to allow full, open presentation of views; that is, don't prepare it in private without public review, input and comment.
3. Be honest about contents. In addition to the totally unbelievable and unachievable schedules presented in the 1984 edition of the FRP, the issue regarding GPS user costs (or, in fact, the user charges for other systems and the methods of collection) are, to say the least, unclear. It is said that there will be no explicit user charges for GPS at this time (whatever that means). But the GPS signals are encoded so as to provide the means of collection enforcement later on. Also the policy statement of the FRP says that system costs are to be recovered using the existing mechanisms; higher system costs mean higher landing fees, port charges, etc.
4. In the case of GPS or similar systems which will come on line as military systems, allow limited public access until the market forces illustrate that such a system could be a viable civilian system. Specifically, do not make decisions regarding GPS as a civilian system until it is fully deployed, its advantages and disadvantages known, and until the market forces have had an opportunity to show acceptance or rejection.

EVEN WHEN A SYSTEM'S SIGNALS ARE AVAILABLE FOR PUBLIC USE UNDER DOD FUNDING, A DECISION ON CIVILIAN USE SHOULD BE DELAYED UNTIL THE BEST COMMERCIAL FORCES (USING THE AVAILABLE SIGNALS) CAN FACTUALLY SHOW ADVANTAGES TO THE GOVERNMENT, TO THE TAXPAYER, AND TO THE USER. IN PARTICULAR THESE ADVANTAGES SHOULD BE DEMONSTRATED BEFORE SUCH A SYSTEM IS ALLOWED TO SUPPLANT EXISTING SYSTEMS.

5. The recent shuttle situation tragically illustrates what can happen when political, budgetary or schedule considerations take the place of safety as the prime consideration. Since the purpose of the FRP is to define a mix of systems to safely meet various requirements at an affordable cost, this purpose must be kept in mind at all stages of the FRP evolution.
6. In addition, consideration should be given to three key evolving issues in any upcoming FRP:
 - a. Non-governmental operated aid-to-navigation systems (GEOSTAR, privatized Loran-C, etc.)
 - b. World-wide systems operated by other nations or groups of nations (GLONAS, NAVSAT, etc.)
 - c. Potential increased risk of terrorism due to civil availability of world-wide radionavigation capability.

F. SUMMARY OF KEY ISSUES:

1. GPS appears to have great potential as a precision world-wide radionavigation system to satisfy U.S. national defense requirements. Development and implementation of this system is fully justified on the basis of DOD requirements for national security.
2. United States civil users are concentrated in continental U.S. and in the coastal confluence zone. The requirements of these users are economically satisfied with the existing VOR/DME and Loran-C regional radionavigation systems.
3. The GPS accuracy that might become available for civil use without compromise to national security is expected to be somewhat poorer than that already available from Loran-C.
4. Although common use military/civil systems may initially appear very advantageous from a cost standpoint, retention of less costly and in place systems for civil use are in reality very cost effective.
5. The timetable for making final National decisions re civil use of GPS, Loran-C, VOR/DME, and Omega in 1987 as announced in the FRP is very premature. These decisions can not be taken until the procedures outlined in FRP Section 4.5, SELECTING RADIONAVIGATION SYSTEMS TO BE USED IN THE FUTURE, are fully followed. In particular, realistic final determinations of combined User/Government cost, and system and product reliability cannot be made until GPS is fully operational and until civil and military user equipment is available for use and evaluation.
6. Historically, FRP timetables have been overly optimistic and unrealistic. The planning process needs to be much more realistic, to properly and effectively support the policy decision process.