third antenna system will be used as a spare, providing redundancy should one system fail.

The antenna system will be computer driven. Orbital elements will be routinely scheduled, computed, and sent to the CDA stations by the master PACC (PACC East).

2.1.2 Receiving

The receiving subsystem comprises low noise amplifiers, receivers and a number of demodulators and signal processing units to be dimensioned according to the number of channels and the effective system use.

This subsystem also performs accurate time stamping and frequency measurement on the INBOUND link messages; these measurements are then used in the processing center for positioning computation. This subsystem will contain low noise amplifiers, receivers, and demodulators. The signal processing units will be dimensioned according to the number of channels and the effective system usage.

2.1.3 Transmission

This subsystem comprises signal processors, modulators and output amplifiers. Transmissions are synchronized to the time reference subsystem.

2.1.4 Time Reference

Each CDA will contain a high accuracy timing source connected to a WWV receiver or similar timing standard. The timing source will provide the input for the ranging subsystem, message tagging subsystem, and the antenna positioning subsystem.

Though the STARNET constellation deployment plan provides for first coverage opportunities for the U. S., future plans include European and North Atlantic coverage from a CDA station in France. Figure VII.C.2-3 shows the coverage of the European system.

Each CDA will house a Reference and Calibration Platform (RCP) to be used for satellite location determination. Additional RCPs are located world-wide to increase the satellite position accuracy as well as the terminal position accuracy through differential positioning.

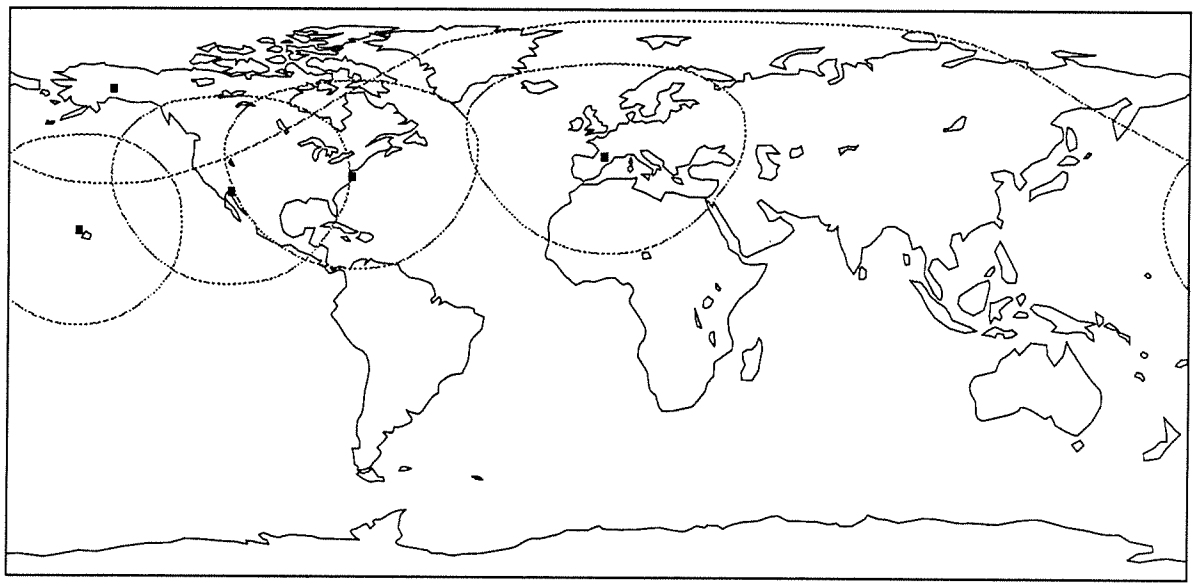


Figure VII.C.2-3

2.1 CDA Subsystems

2.1.1 Antenna

Each CDA will contain three (3) complete antenna systems. Each antenna will have a minimum of 16 dbi gain, and will have transmit and receive capability. Each antenna will be mounted on a two-axis positioner which will be pedestal mounted.

Two (2) antennas will be required to track two (2) different satellites when two (2) satellites are in view (the footprints overlapping). The

2.1.5 Reference and Calibration Platform

Each CDA station will house a precisely surveyed Reference and Calibration Platform (RCP) to be used for satellite position determination, as well as the user terminal location through differential Doppler. Another ten (10) RCP's will be spaced world-wide to further increase the satellite's position accuracy, and to serve this community as STARNET evolves.

2.1.6 Computer

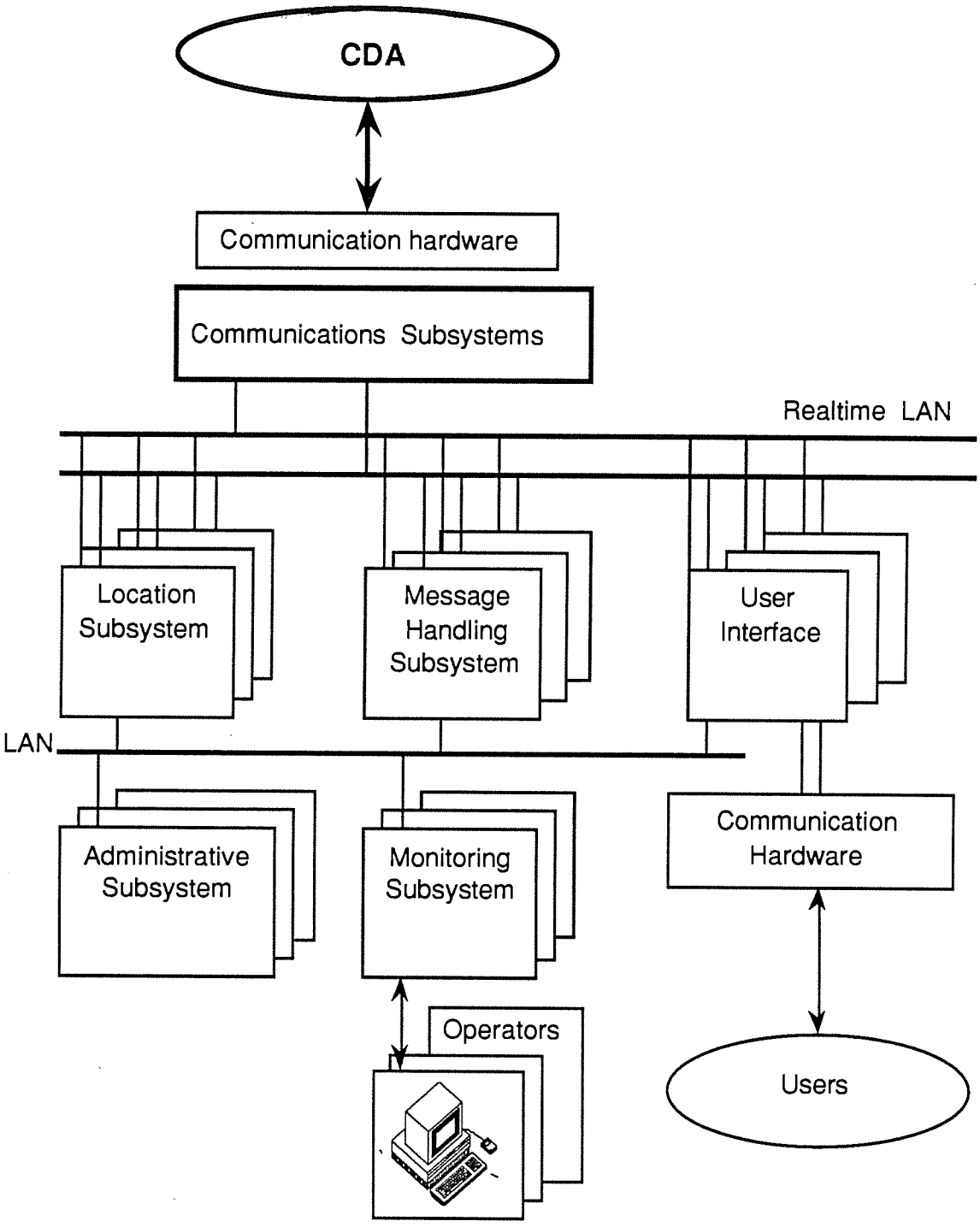
Each CDA will contain a number of micro- and mini-computers integrated through redundant LANs. Micro-computers will also be used for message routing and handling.

2.1.7 Communication

The CDAs will be interfaced to the Processing, Analysis and Control Centers (PACCs) with standard 56 kbps digital lines. This subsystem will have a buffering capability to avoid in-and-out message losses. This subsystem also handles alternative line routing in the event of primary line failure.

3. Processing, Analysis and Control Centers (PACCs)

Two (2) PACCs will be operated in the CONUS, one on the East Coast (PACC East), the other on the West Coast (PACC West). The two (2) centers are geographically located such as to best serve the needs of the regional users. Each center will primarily process the data for the users in their respective regions, but each will have the capacity to process all of the CONUS data (see Figure VII.C.3).



Processing and Analysis Control Center (PACC)

Figure VII.C.3

The main functions of the PACCs are:

- message handling
- location processing
- user interface
- system command and control.

3.1 PACC Subsystems

3.1.1 Communication

The PACC communications subsystems will communicate with the CDAs to receive user terminal messages, raw ranging data, and Doppler measurements. The subsystem will transmit user terminal messages, satellite commands and orbital information to the CDAs. This subsystem will also manage the high capacity interface between the two (2) PACCs.

The communications subsystem will interface the PACCs using standard 56 kbps digital links. This subsystem will have a buffering capability to avoid in-and-out message losses. This subsystem will also handle alternative routing in the event of failure of the link with the processing center.

3.1.2 Positioning

The positioning subsystem will compute the user terminal locations according to terminal type and class of service, as well as the satellite orbital data.

3.1.3 Message Handling

The message handling subsystem routes messages through the system, to and from the CDAs, to and from the other PACCs, and to and from the telecommunication network.

3.1.4 Administrative

The administrative subsystem manages the terminal and user informational data bases, user billing, and other interfaces dealing with user services.

3.1.5 User Interface

This subsystem starts as an interface with the telecommunication network and houses the following value-added services:

- 1-800 STARNET voice interface
- User mail box
- Proximity service (e.g., "10 miles NW Chicago")
- Service based Computer-to-Computer (CTC) interfaces.

3.1.6 Command and Control

STARSYS, Inc. will operate two (2) STARNET Operations Control Centers (SOCCs), one of which will be co-located with PACC East. A backup SOCC will be co-located at PACC West.

The SOCCs will be operated twenty-four (24) hours a day, seven (7) days a week, since there is always at least one satellite in the field of view. Outside critical phases (such as a launch), monitoring of each spacecraft will be done on a daily basis.

The SOCCs will also have the responsibility to compute the orbital elements for the twenty-four (24) satellites and to forward these elements to all the regional CDAs operating world-wide. These orbital elements are also forwarded to the CDAs for tracking purposes.

The SOCCs provides:

- satellite control for satellite telemetry health and safety monitoring

- CDA station control for alarm monitoring and tracking strategy optimization
- system control for traffic and load observations.
- processing center control for center behavior and automatic reconfiguration procedures.

4. User Terminals

The user terminals are designed to be small, light-weight (50 to 100 grams). Low cost can be achieved using widely used VHF components on 1W terminals.

These terminals are likely to find applications in a wide-range of environments. Major applications by user terminal type include:

- terrestrial vehicles,
- maritime applications,
- personal, hand-held (pocket sized),
- fixed.

Basically, the main types of user terminals are:

1. "LOCPAC"SM, a simple transmit only terminal for one-way pre-programmed transmission to a PACC, wherein location is calculated by differential Doppler in the PACC.

   Cost: ~ $50.00

2. "HELPAC"SM , a two-way communications user terminal for alarm messaging and location with built-in acknowledgement of message received by PACC. The basic terminal will have simple transmit and receive channels with an omnidirectional antenna. Only one type of message will be send and received by the terminal. The fourteen (14) channels available will be randomly assigned during the manufacturing process location calculation will be computed upon reception of only one message

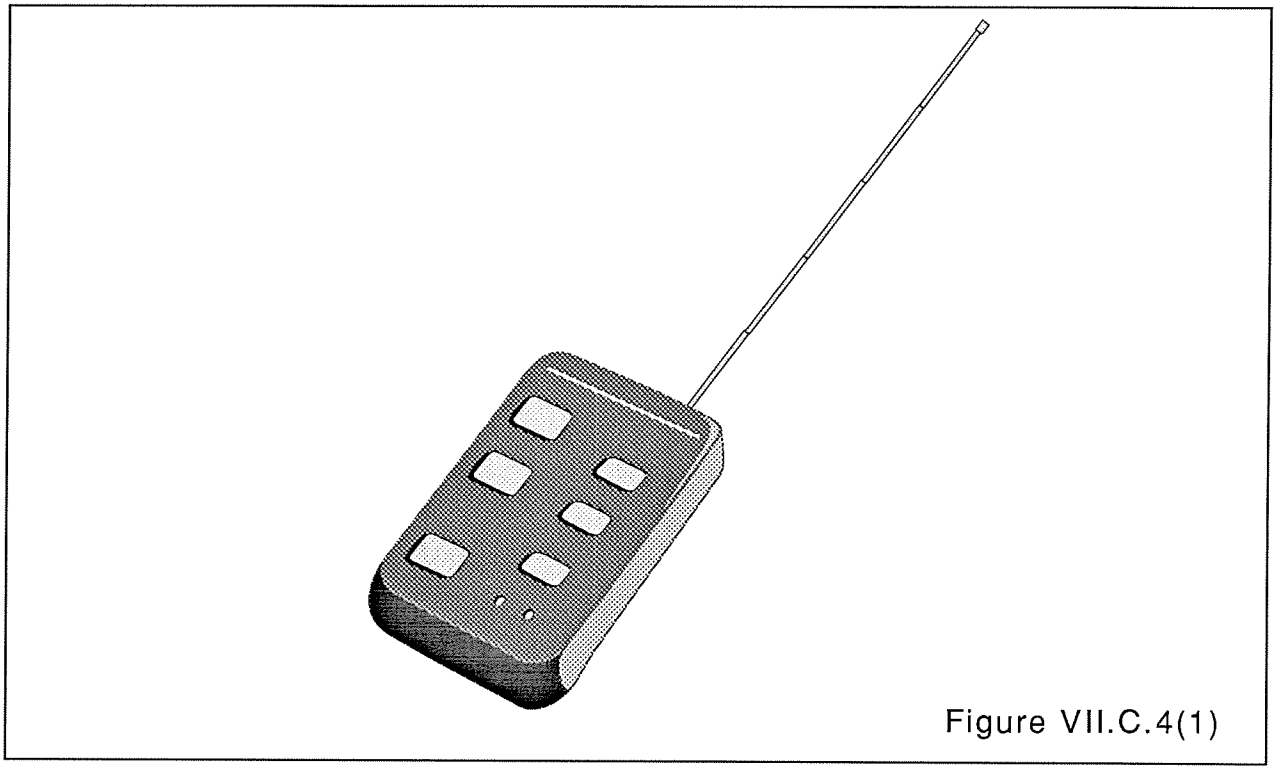


Figure VII.C.4(1)

by using ranging and Doppler measurements (see Figure VII.C.4(1)).

Cost: ~$75.00

3. "KEYPAC"SM, an improved two-way communications terminal with the capability for the user to enter and receive thirty-two (32), characters over one of the fourteen (14) randomly assigned channels. The maximum number will be one-hundred (100) characters. (see Figure VII.C.4(2)).

Cost: ~$125.00 - $150.00

4. "DATAPAC"SM, a two-way data collection and location terminal appropriate for all types of in-situ environmental monitoring. This user terminal will be a direct replacement for all Argos system terminals currently operating on 401.65 Mhz.

Figure VII.C.4(2)

Cost: ~$100.00 - $125.00

User terminals will be manufactured and marketed by the U. S. consumer electronics industry.

5. Operations

STARSYS, Inc. will have the global system responsibility as system designer and owner. STARSYS, Inc. will also have the responsibility to operate the STARNET system in north America.

5.1 Global Responsibility

Global responsibility is composed of those technical operations conducted under system management, plus the contractual

responsibilities involved in coordination with licensed operators in other countries.

5.1.1 System Management

System management includes all the tasks that have to be performed once on a world-wide basis, while system usage is managed on a regional basis. This includes the in-orbit spacecraft monitoring, constellation build-up and maintenance, system performance monitoring and improvment.

5.1.1.1 Spacecraft Monitoring

Management of the STARNET Operations Control Centers (SOCCs) will be conducted at PACC East and PACC West. Each center will share monitoring of the satellites (e.g. 12 at every center). The PACCs (and SOCCs), will be operated twenty-four (24) hours a day, seven (7) days a week, since there will always be at least one (1) satellite in view. The SOCCs will also compute the satellite's orbit. Other than launch support activities, monitoring of each spacecraft will be done on a daily basis.

5.1.1.2 Constellation Build-up and Maintenance

STARSYS, Inc. will progressively build up the STARNET constellation of twenty-four (24) satellites. Timing of the next spacecraft launch will be based on:

- FCC approval;
- launch opportunity; and
- satellite operability.

The proposed spacecraft lifetime is five (5) years. It will thus be necessary to schedule manufacturing replacement and launches.

5.1.1.3 System Performance Monitoring

The global performance of the system will be systematically checked against the designed performance, and take into account regional traffic loads.

Analysis of the measured performance versus the evolution of the market will target the need for system enhancement, which will be done either by modifying the spacecraft design or through software modifications in the PACCs.

5.1.2 Licensing Coordination in Other Countries

STARSYS, Inc. will coordinate through licensed operators in other countries for contractual matters and for technical information. User terminals will be operated only in accordance with national regulations and ITU Rules.

5.2 Regional Responsibility

STARSYS, Inc. will closely monitor the performance of the two (2) PACCs and the other two (2) regional CDAs (Alaska and Hawaii), in order to insure routine and timely service to all North American users. The different tasks to be performed are principally: i) operation of the ground facilities, ii) performance monitoring, and iii) user services.

5.2.1 Usage Within the U. S.

The two U. S. PACCs will be operated twenty-four (24) hours a day, seven (7) days a week. One is the back-up of the other, and both PACCs have the capability of processing all the North American user terminals without any performance degradation.

North American STARNET users will be assigned to either the east or west center depending on their geographical area of operation.

5.2.2 Performance Within the U. S.

Performance monitoring within the U. S. mainly deals with system usage and traffic load. With 10 to 20 million captured users, the traffic load could alter the performance of specific applications. Actions will have to be taken either on system design or on marketing policy or tariff structure.

5.2.3 User Services

Management of 10 to 20 million users is a complex task. Space related companies are not yet well prepared to do it. Nevertheless, experience gained through its business affiliates puts STARSYS, Inc. in a very competitive position with respect to non-space related companies.

All mass processing like subscriptions and billing will be sub-contracted to companies well established and reputable: manufacturers and/or dealers for subscriptions, banks for billing and payment through credit cards.

STARNET operators will be in permanent close contact with appropriate Emergency Service Authorities in the various states and counties.

Specific applications such as rented car surveys will need direct contact with each car rental company.

5.2.3.1 Contact with Manufacturers and Dealers

Unique user terminal identification numbers and random channels will be assigned during manufacturing.

Dealers will have the obligation to sell equipment specific to the application, complete with proper operating instructions.

Dealers will sell the equipment with a one year service warrantee.

Use of the emergency call will be charged separately, directly to users or to insurance companies or to any third parties with whom contracts are established.

5.2.3.2 Billing Services and Subscriptions

Manufacturers will be assigned terminal IDs by blocks of 10,000 or 100,000. Corresponding subscriptions can be entered manually and billed.

The starting date of the subscription is the date of selling. The dealer will complete a form with name, address of new owner, type of use, type of emergency, region of operation, etc. This information will be entered into the PACC computers through standard telephone networks using a smart terminal.

5.2.3.3 Emergency Service Authorities

STARNET will be known by the different Emergency Services, and recognized as a reliable and low cost Personal Emergency Messaging and Positioning Service. When a STARNET operator calls, he has to be believed and the required emergency service must proceed immediately without question.

Required information will be given and needed connections with these services will be established before the start of operational STARNET services, and will be maintained thereinafter.

5.2.3.4 Car Rental Companies

An example involving an auto rental company:

All rented cars of Company X will be fitted with a STARNET terminal. As an example, the terminal will transmit regularly when the rental

contract is ended, or in event of accident, personal emergency, or on rental company demand.

All terminal transmissions will be routed to the company, which is responsible for the follow-up.

Subscription and billing functions only deal with the company.

D. PROGRAM AND LAUNCH SCHEDULE

1. Introduction

The Program Schedule for the STARNET system is designed to provide a global LEO MSS communications network through 24 operational satellites by 15 September 1995. The Program Schedule presented here is based upon Commision approval of this application on or before 15 June 1991.

The complete constellation of 24 satellites will be launched within fifty-one (51) months after Commission approval.

Satellites will be designed and quality controlled twelve (12) months after program inception. Delivery of the satellites will commence twenty-four (24) months after Commision approval. Satellite manufacturer schedules are to deliver three (3) satellites a quarter over eight (8) quarters. Satellite integration on the launcher is four (4) months for the first launch and one (1) month for subsequent launches.

Launches will be conducted at a rate of three (3) every quarter. Spares will be provided and launched as required.

The launch period will start from the third quarter of 1994 to the second of 1995, assuming Commision approval in the second quarter of 1991.

The key STARNET program milestones are divided into two categories: pre-contract program commoon events, and spacecraft- specific events.

2. Pre-Contract Events

Pre-contract events, i.e., those activities leading up to and including the execution of a contract for the procurement of spacecraft, launch vehicles, and launch services for the STARNET program, include:

- Preparation and issuance of an "Request for Proposals for satellites, launch vehicles and launch services, (120 days);
- Submission by industry of proposals for spacecraft construction, launch vehicles and launch services, (90 days);
- Evaluation of proposals; selection of contractors, (30 days);
- Spacecraft contract finalization, (30days);
- Launch vehicle/launch services contract finalization, (60 days from spacecraft contract finalization).

3. Spacecraft-Specific Events

The spacecraft manufacturing program and launch schedule is designed to enable total system operation to commence on 15 September 1995. The STARNET program schedule allows 24 months for the manufacturing and testing of each of the 24 operational components of the STARNET system. Launches will be conducted at a rate of three (3) a quarter.

Spacecraft-specific events are depicted in Table 1, and include:

- Initiation of spacecraft consrtruction;
- Completion of spacecraft construction;
- Spacecraft launch/in-orbit testing; and,
- Spacecraft ready for service.

The STARNET control centers will be procured as part of the spacecraft contract and will be completed four (4) months before the launch of F1.

TABLE 1:

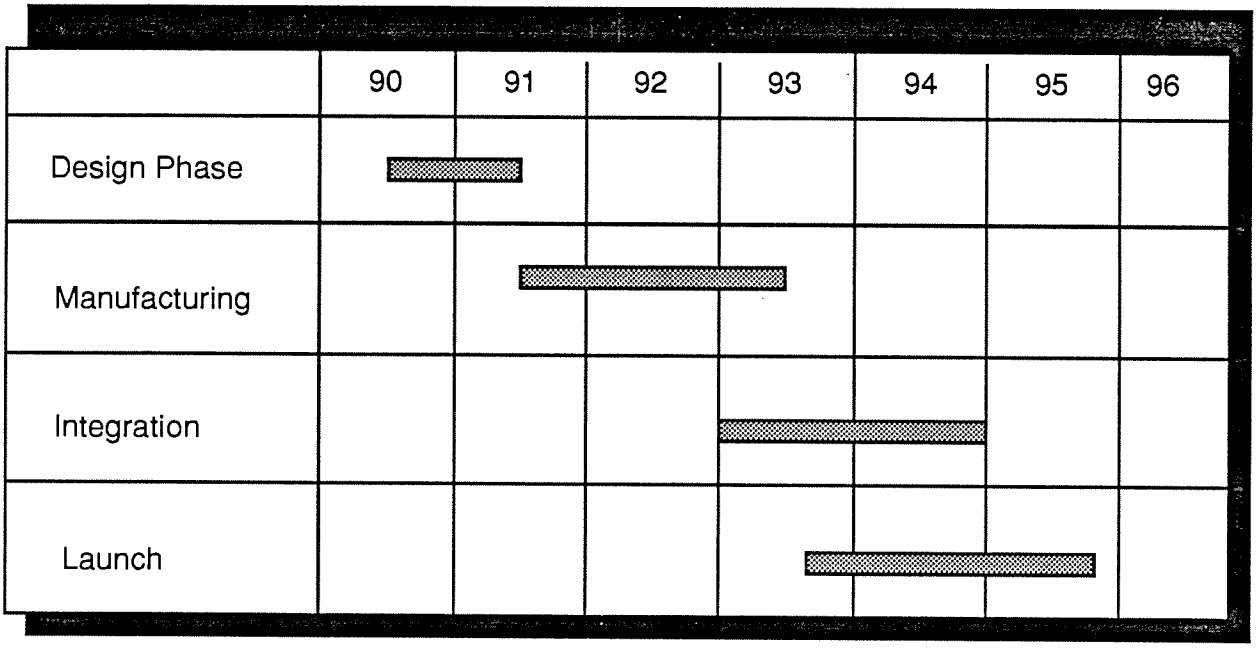
PART 1	FCC AUTHORIZATION TO PROCEED	6/15/91
PART 2	PROGRAM SCHEDULE	
	a. Spacecraft RFP	12/15/90
	b. Spacecraft Proposal Received	4/15/91
	c. Spacecraft Contractor Selected	5/15/91
	d. Spacecraft Contract Finalized	6/15/91
	e. Launch Vehicle/Services Contract Execution	8/15/91

PART 3 SCHEDULE FOR SPACECRAFT

A = Spacecraft construction initiated
B = Spacecraft construction completed
C = Spacecraft launch
D = Spacecraft placed in service

S/C	A	B	C	D
F1	6/15/91	6/15/93	10/15/93	11/15/93
F2	7/15/91	7/15/93	11/15/93	12/15/93
F3	8/15/91	8/15/93	12/15/93	1/15/94
F4	9/15/91	9/15/93	1/15/94	2/15/94
F5	10/15/91	10/15/93	2/15/94	3/15/94
F6	11/15/91	11/15/93	3/15/94	4/15/94
F7	12/15/91	12/15/93	4/15/94	5/15/94
F8	1/15/92	1/15/94	5/15/94	6/15/94
F9	2/15/92	2/15/94	6/15/94	7/15/94
F10	3/15/92	3/15/94	7/15/94	8/15/94
F11	4/15/92	4/15/94	8/15/94	9/15/94
F12	5/15/92	5/15/94	9/15/94	10/15/94

F13	6/15/92	6/15/94	10/15/94	11/15/94
F14	7/15/92	7/15/94	11/15/94	12/15/94
F15	8/15/92	8/15/94	12/15/94	1/15/95
F16	9/15/92	9/15/94	1/15/95	2/15/95
F17	10/15/92	10/15/94	2/15/95	3/15/95
F18	11/15/92	11/15/94	3/15/95	4/15/95
F19	12/15/92	12/15/94	4/15/95	5/15/95
F20	1/15/93	1/15/95	5/15/95	6/15/95
F21	2/15/93	2/15/95	6/15/95	7/15/95
F22	3/15/93	3/15/95	7/15/95	8/15/95
F23	4/15/93	4/15/95	8/15/95	9/15/95
F24	5/15/93	5/15/95	9/15/95	10/15/95
F25	6/15/93	6/15/95	10/15/95	11/15/95
F26	7/15/93	7/15/95	11/15/95	12/15/95


90
91
92
93
94
95
96
Design Phase
Manufacturing
Integration
Launch

F. ENGINEERING CERTIFICATE

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in these applications, that I am familiar with Part 25 of the Commission's Rules and Regulations, that I have reviewed the engineering information submitted in these applications, and that it is complete and accurate to the best of my knowledge.

Dated this 4th day of May, 1990

By: /s/ Jean-Luc Bessis
Jean-Luc Bessis
President
North American CLS, Inc.

CONCLUSION

In the foregoing parts of this application, STARSYS has demonstrated that its proposed STARNET system will advance numerous public, national, and global interests. In addition, STARSYS has shown that it is legally, technically, and financially qualified to construct the 24 in-orbit spacecraft that will comprise STARNET.

Never before has a single satellite system stood to offer the universally-available, low-cost, and spectrally-efficient mobile communications and position-determining services that STARSYS seeks to provide. STARSYS urges the Commission to act expeditiously to grant this application and to authorize STARSYS to construct the STARNET system.

Respectfully submitted,

STARSYS, INC.

By: /s/ Ashok Kaveeshwar
Ashok Kaveeshwar
President
STARSYS, Inc.
2000 K Street, N.W.
Suite 620
Washington, D.C. 20006

Raul R. Rodriguez
Stephen D. Baruch
Leventhal, Senter & Lerman
2000 K Street, N.W.
Suite 600
Washington, D.C. 20006
(202) 429-8970

Its Attorneys

May 4, 1990

PORTUGAL			
	DESTRUCTIVE EARTH QUAKES	INST NAC INVEST	SEISMOLOGY
Total = 1			
RFA			
	WINTER WEDDELL GYRE	A.WEGENER INST.POL.	OCEANOLOGY
	SWAN MIGRAT.	INST.NATURSCHUTZ	BIOLOGY
	SUBSURF.MOORING BUOY	SENSOR INST. SYST	OCEANOLOGY
Total = 3			
ROC			
	TAIWAN FISH ACT	TAIWAN FISH ASSN	FISHERIES
Total = 1			
S.AFRICA			
	MIT ENVIRONM DATA	CSIR	OCEANOLOGY
Total = 1			
UK			
	ALBATROSSES S.GEORGIA	BRIT. ANTARCT.SURVEY	BIOLOGY
	RAE WAVE TRIAL	SPACE TECH SYST LTD	OCEANOLOGY
	RIVER WEY DISCH	WS OCEANOLOGY SYST.	OCEANOLOGY
	ELEPHANT MONITORING	ZOOLOGICAL OF LONDON	BIOLOGY
Total = 4			
USA			
	FARFIELD DRIFTER PROG	BATTELLE MEMORIAL	POLLUTION
	SWADE	BROOKHAVEN NAT LAB	OCEANOLOGY
	ARCHAEOLOGICAL STUDY	BUREAU OF LAND MNGT	LAW ENFORC.
	TIER 3 106 MILES	CLEARWATER CONS.	OCEANOLOGY
	FHD PROG	HOR.MAR.INC.	OCEANOLOGY
	OIL & GAS PIPELINE	HOUSTON DATA TRANSM	POLLUTION
	NY FLOATABLE	HYDROQUAL	OCEANOLOGY
	AUT. GEOPHY.OBSERV	LOCKHEED RES. LAB.	SEISMOLOGY
	SIBERIAN CRANE	NASA	BIOLOGY
	WAMP	NDBC	METEOROLOGY
	TAIWAN FISH VESSELS	NOAA	FISHERIES
	SEFCAR	NOAA/AOML	OCEANOLOGY
	MARINE MAMMAL FORAGING	NOAA/NAFC	BIOLOGY
	TESKESPUK CARIBOU	NORTH SLOPE BOROUGH	BIOLOGY
	NATIO SCIENT BALLOON FAC	NSBF	AERONOMY
	POPUP	OCEANOLOGY SENSORS INC	OCEANOLOGY
	DARPA/LLNL SSV	SCIENT.RESEARCH LAB	METEOROLOGY

CARTESIAN DIVER OBSERV	SCRIPPS INST	OCEANOLOGY
O&C CAPE COD	UNIV OF NH	OCEANOLOGY
ABACO ISLAND - RAFOS	UNIV. MIAMI	OCEANOLOGY
MINNESOTA WOLF DISP.	US FOREST SERV.	BIOLOGY
OIL SPILL VESSEL	VECO INC	POLLUTION
WORLD OUTBOARD ENDEAV.	WARRIOR INC	EXPEDITION
AMASSEDS	WOODSHOLE INST	OCEANOLOGY
ARCTIC ICE TOMOGRAPHY	WOODSHOLE INST	OCEANOLOGY
PHYS OCEA SURVEY MASS	WOODSHOLE INST	OCEANOLOGY
BIOSPAR	WOODSHOLE INST	OCEANOLOGY
STRUC WARM CORE	WOODSHOLE INST	OCEANOLOGY

Total = 28

TOTAL NUMBER OF PGM 90

EXHIBIT VI

MARCOR, Inc., a Washington, D.C. corporation, owns 5 percent of the voting stock of Filer.* The business address of MARCOR, Inc. is 800 K Street, N.W., Suite 750, Washington, D.C. 20001.

North American CLS, Inc., a Delaware corporation, owns 95 percent of the voting stock of Filer.** The business address of North American CLS, Inc. is 1801 McCormick Drive, Suite 10, Landover, Maryland 20785.

* The shares of Filer owned by MARCOR, Inc. carry 20 director votes per share.

** The shares of Filer owned by North American CLS, Inc. carry 1 director vote per share.

EXHIBIT VII

STARSYS, Inc. Officers and Directors:

Dr. Ashok Kaveeshwar (President and Director)
2000 K Street, N.W.
Suite 620
Washington, D.C. 20006

Jean-Luc Bessis (Director)
2000 K Street, N.W.
Suite 620
Washington, D.C. 20006

Wilbur Pritchard (Director)
2000 K Street, N.W.
Suite 620
Washington, D.C. 20006

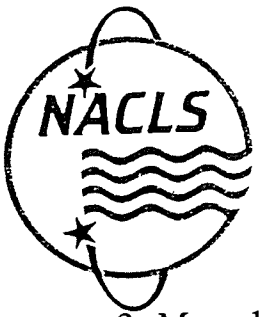
Martin Rothblatt (Director)
2000 K Street, N.W.
Suite 620
Washington, D.C. 20006

Lisa Shaffer (Director)
2000 K Street, N.W.
Suite 620
Washington, D.C. 20006

EXHIBIT VIII

MARCOR, Inc., a Washington, D.C. corporation with its principal place of business at 800 K Street, N.W., Suite 750, Washington, D.C., is a telecommunications consulting firm. Martin Rothblatt, a United States citizen with the same business address as MARCOR, Inc., is the sole stockholder of MARCOR, Inc. Martin Rothblatt is the president and a director of MARCOR, Inc. Bina Rothblatt and Eleanor Leung are directors of MARCOR, Inc., with the same business addresses as MARCOR, Inc.

The nature and extent of the control of MARCOR, Inc. over STARSYS, Inc. is explained in Attachment A hereto.



Attachment A
FCC Form 430
Exhibit VIII

NORTH AMERICAN COLLECTION & LOCATION BY SATELLITE

2 May 1990

Mr. Martin Rothblatt
President
MARCOR, Inc.
Techworld Plaza
Washington, D.C. 20001-8000

Dear Martin,

I understand that you are willing to serve as an independent Director of our new company, STARSYS, Incorporated. We greatly appreciate having a person of your stature willing to serve on our Board, and we hereby formally invite you to be elected as one of five founding Directors this week.

It is agreed that your primary purpose as an independent Director of STARSYS is to help insulate the business from the possibility of any foreign governmental influence on its operations as an FCC licensee. Each Director will do his best to ensure STARSYS complies with its charter to operate a LEO MSS system in the U.S. public interest, along the lines described to the FCC in our Application, a draft of which will be sent to you by courier.

At our founding Board meeting, we expect to approve a resolution authorizing $8,000 per Director in outside Director fees for the year May 1, 1990 through April 30, 1991. Such fees will be paid in four installments: one-fourth on May 15th, 1990; one-fourth on August 15th, 1990; one-fourth on November 15th, 1990; one-fourth on February 15th, 1991, and on the same dates during each succeeding one year period. It is also agreed that each of you will voluntarily resign from the Board in the event STARSYS business is abandoned due to lack of FCC approval or if the company is dissolved. No further Director fees would be owed in these cases.

NACLS, INC.

1801 McCORMICK DRIVE, SUITE 10 ● LANDOVER, MARYLAND 20785 ● (301) 341-1814 ● TELEX: 898 146 FAX: 925-8995
CLS SERVICE ARGOS 18, AVENUE EDOUARD-BELIN 31055 TOULOUSE CEDEX Tel. 61 27 43 51 Telex 531 752F FRANCE

It is understood that nothing in your Directorship will require you to be in conflict with Geostar or its subsidiaries, nor to compete with that company or its subsidiaries. Should any issue of potential competition with Geostar arise, either directly or indirectly, you shall be permitted to recuse yourself from those discussions, and that you in fact have advised me that you will recuse yourself.

Please call me to confirm that your understandings are the same as mine, and show your agreement by signing below.

Sincerely,

Jean-Luc Bessis
President, NACLS

Date: May 2, 1990

AGREED:

Martin Rothblatt
President, MARCOR, Inc.

Date: 5/2/90

APPENDICES

FCC 430

FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

Approved by OMB
3060-0105
Expires 3/31/90

COMMON CARRIER AND SATELLITE RADIO LICENSEE QUALIFICATION REPORT

See reverse side for information regarding public burden statement.

INSTRUCTIONS

A. The "Filer" of this report is defined to include: (1) An applicant, where this report is submitted in connection with applications for common carrier and satellite radio authority as required for such applications; or (2) A licensee or permittee, where this report is required by the Commission's Rules to be submitted on an annual basis.

B. Submit an original and one copy (sign original only) to the Federal Communications Commission, Washington, DC 20554. If more than one radio service is listed in Item 6, submit an additional copy for each such additional service. If this report is being submitted in connection with an application for radio authority, attach it to that application.

C. Do not submit a fee with this report.

1. Business Name and Address (Number, Street, State and ZIP Code) of Filer's Principal Office:
STARSYS, Inc.
2000 K Street, N.W., Suite 620
Washington, D.C. 20006

2. (Area Code) Telephone Number:
(301) 495-0172

3. If this report supercedes a previously filed report, specify its date:
N/A

4. Filer is (check one):
☐ Individual ☐ Partnership ☒ Corporation
☐ Other (Specify):

5. Under the laws of what State (or other jurisdiction) is the Filer organized?
Delaware

6. List the common carrier and satellite radio services in which Filer has applied or is a current licensee or permittee:

None

7(a) Has the Filer or any party to this application had any FCC station license or permit revoked or had any application for permit, license or renewal denied by this Commission? ☐ Yes ☒ No
If "YES", attach as Exhibit I a statement giving call sign and file number of license or permit revoked and relating circumstances.

(b) Has any court finally adjudged the Filer, or any person directly or indirectly controlling the Filer, guilty of unlawfully monopolizing or attempting unlawfully to monopolize radio communication, directly or indirectly, through control of manufacture or sale of radio apparatus, exclusive traffic arrangement, or other means of unfair methods of competition? ☐ Yes ☒ No
If "YES", attach as Exhibit II a statement relating the facts.

(c) Has the Filer, or any party to this application, or any person directly or indirectly controlling the Filer ever been convicted of a felony by any state or Federal Court? ☐ Yes ☒ No
If "YES", attach as Exhibit III a statement relating the facts.

(d) Is the Filer, or any person directly or indirectly controlling the Filer, presently a party in any matter referred to items 7(b) and 7(c)? ☐ Yes ☒ No
If "YES", attach as Exhibit IV a statement relating the facts.

8. Is the Filer, directly or indirectly, through stock ownership, contract or otherwise, currently interested in the ownership or control of any other radio stations licensed by this Commission? ☐ Yes ☒ No
If "YES", submit as Exhibit V the name of each such licensee and the licensee's relation to the Filer.

If Filer is an individual (sole proprietorship) or partnership, answer the following and Item 11:

9(a) Full Legal Name and Residential Address (Number, Street, State and ZIP Code) of Individual or Partners:

(b) Is individual or each member of a partnership a citizen of the United States? ☐ Yes ☐ No

(c) Is individual or any member of a partnership a representative of an alien or of a foreign government? ☐ Yes ☐ No

If Filer is a corporation, answer the following and Item 11:

10(a) Attach as Exhibit VI the names, addresses, and citizenship of those stockholders owning of record and/or voting 10 percent or more of the Filer's voting stock and the percentages so held. In the case of fiduciary control, indicate the beneficiary(ies) or class of beneficiaries.

See Exhibit VI

(b) List below, or attach as Exhibit VII the names and addresses of the officers and directors of the Filer.

See Exhibit VII

(c) Is the Filer directly or indirectly controlled by any other corporation? ☒ Yes ☐ No

If "YES", attach as Exhibit VIII a statement (including organizational diagrams where appropriate) which fully and completely identifies the nature and extent of control. Include the following: (1) the address and primary business of the controlling corporation and any intermediate subsidiaries; (2) the names, addresses, and citizenship of those stockholders holding 10 percent or more of the controlling corporation's voting stock; (3) the approximate percentage of total voting stock held by each such stockholder; and (4) the names and addresses of the president and directors of the controlling corporation.

See Exhibit VIII

(d) Is any officer or director of the Filer an alien? ☐ Yes ☐ No

(e) Is more than one-fifth of the capital stock of the Filer owned of record or voted by aliens or their representatives, or by a foreign government or representative(s) thereof, or by a corporation organized under the laws of a foreign country? ☐ Yes ☐ No

(f) Is the Filer directly or indirectly controlled: (1) by any other corporation of which any officer or more than one-fourth of the directors are aliens, or (2) by any foreign corporation or corporation of which more than one-fourth of the capital stock is owned or voted by aliens or their representatives, or by a foreign government or representatives thereof. ☐ Yes ☐ No

(g) If any answer to questions (d), (e) or (f) is "YES", attach as Exhibit IX a statement identifying the aliens or foreign entities, their nationality, their relationship to the Filer, and the percentage of stock they own or vote.

11. CERTIFICATION

This report constitutes a material part of any application which cross-references it, and all statements made in the attached exhibits are a material part thereof. The ownership information contained in this report does not constitute an application for, or Commission approval of, any transfer of control or assignment of radio facilities. The undersigned, individually and for the Filer, hereby certifies that the statements made herein are true, complete and correct to the best of Filer's knowledge and belief, and are made in good faith.

WILLFUL FALSE STATEMENTS MADE ON THIS APPLICATION ARE PUNISHABLE BY FINE AND IMPRISONMENT (U.S. Code, Title 18, Section 1001) and/or REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. Code, Title 47, Section 312(a)(1)).	Date	Filer (Must correspond with that shown in Item 1)	Typed or Printed Name
	05/04/90	STARSYS, Inc.	Dr. Ashok Kaveeshwar
	Signature		Title
	/s/ Ashok Kaveeshwar		President

NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT OF 1974 AND THE PAPERWORK REDUCTION ACT OF 1980

The solicitation of personal information requested in this form is to determine if you are qualified to become or remain a licensee in a common carrier or satellite radio service pursuant to the Communications Act of 1934, as amended. No authorization can be granted unless all information requested is provided. Your response is required to obtain the requested authorization or retain an authorization.

Public reporting burden for this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Federal Communications Commission, Office of Managing Director, Washington, DC 20554, and to Office of Management and Budget, Paperwork Reduction Project (3060-0105), Washington, DC 20503.

APPENDIX 2

REFER TO "Volume 2: Individual Applications"

APPENDIX 3

LIST OF STARNET PREDECESSOR TECHNOLOGY USERS

Since 1978, more than 1000 User programs (or applications) have used the Argos Data Collection and Location System. These programs involve about 13,000 platforms. Today, data from over 1500 platforms are processed and distributed all over the world, leading to a daily average of 10,500 location determinations and 130,00 processed messages.

The following pages give the status of the system Usage on March 1, 1990 and the list of the new applications approved since May 1989.

ACTIVE PROGRAMS 1ST MARCH 1990

	PROGRAM NAME	ORGANIZATION	FIELD
AUSTRALIA			
	TIDE SEA LEVEL	ABM	OCEANOLOGY
	ACT E&W	ACT ELECTRICITY	HYDROLOGY
	ANTAR.MONIT.	ANTARCTIC DIVISION	METEOROLOGY
	ANT.SURF.MET	ANTARCTIC DIVISION	OCEANOLOGY
	AUS SHIPBOARD PAB TRIAL	AUST.MET.OFF	OCEANOLOGY
	AUST.DRIF.BU	AUST.MET.OFF	OCEANOLOGY
	AUST.AWS	AUST.MET.OFF	OCEANOLOGY
	AUST.CURR.	CSIRO	OCEANOLOGY
	HYDROMETRIC DAC	ENGIN & WATER SUPPLY	HYDROLOGY
	HYDSAT JOINT VENTURE	HYDROL.SERV.PTY LTD	HYDROLOGY
	PERS LOC BEACON	RAN	EXPEDITION
	GULF ST VINCENT WATER	S. AUST DPT OF FISH.	OCEANOLOGY
Total = 12			
BANGLADESH			
	ACEMP	SPARRSO	HYDROLOGY
Total = 1			
BOLIVIA			
	RESEAU D'ALARME HYDRO.	SERV.NACION DE METEO.	HYDROLOGY
Total = 1			
BRAZIL			
	BRAZIL	DNAEE	HYDROLOGY
	INPE'S EXPER ARGOS	INPE'S	METEOROLOGY
Total = 2			

BURKINA FASO			
	ONCHO	OMS	BIOLOGY
Total = 1			
CANADA			
	ATLANTIC BUOY PROGRAM	AES	OCEANOLOGY
	C-NOMAD	AES	METEOROLOGY
	PAPA	AES	METEOROLOGY
	ENV.MONIT.	BEDFORD INST	OCEANOLOGY
	EANW	DEF.DEPT	OCEANOLOGY
	ICE FLOE DRIFT	ENVIRONNEMENT CANADA	OCEANOLOGY
	STOW	FISH & OCEAN	OCEANOLOGY
	ART.PERM.WAT	FISH & OCEAN	HYDROLOGY
	MEDS SATEL WAVEC PROG	FISH & OCEAN	OCEANOLOGY
	BAFFIN ISLD CARIBOU TEL	GVNT N.W.T.	BIOLOGY
	SAT. TELEMET OF VICTORIA	GVNT N.W.T.	BIOLOGY
	OCEAN STORMS	IOS	OCEANOLOGY
	CNDA ICE ISLD RES. STAT	POLAR CONT. SHELF	OCEANOLOGY
	POLAR BEARS	UNIV SASKATSCHEWAN	BIOLOGY
	UNGAVA LABRADOR CARIBOU	WILDLIFE R.C.L.	BIOLOGY
Total = 15			
CHINA			
	YUZIXI BASIN	HYDR SERV SICHUAN	HYDROLOGY
	CHINA SEA	NBO	OCEANOLOGY
Total = 2			
DENMARK			
	WATER POWER	G.T.O	HYDROLOGY
	AWOX	METEOROL. INST.	METEOROLOGY
	DKREF	METEOROL. INST.	TEST
Total = 3			
FINLAND			
	FINNARP WEATHER PROG.	TECH.RES.CENTER	METEOROLOGY
	FINNARP 89	UNIV HELSINKI	OCEANOLOGY
Total = 2			
FRANCE			
	SOLARGOS	AFME	METEOROLOGY
	NAUSSAC VIL	AG.BAS.L.BRE	HYDROLOGY
	SISMOS	C.E.A.	VULCANOLOGY
	DERIPOL-TOGA	C.E.A.	OCEANOLOGY
	PRIPEC	CNET	METEOROLOGY
	SURV OZONE STRATO	CNRS	AERONOMY
	MANCHOTS EMPEREUR	CNRS	BIOLOGY
	ALBATROSS DES TAAF	CNRS	BIOLOGY
	POISON	DOUANES FRANCAISES	POLLUTION
	D.ENNEIGEMENT	EDF	HYDROLOGY
	TRANSMOD	EDF	HYDROLOGY
	PALUEL	EDF/DER	HYDROLOGY

	OPNAV	IFREMER	OCEANOLOGY
	XBT TOGA IFREMER	IFREMER	OCEANOLOGY
	PESTEV	INAG	VULCANOLOGY
	PRIPEC	INAG	METEOROLOGY
	GEOSCOPE	INSU	SEISMOLOGY
	PREV.SEISM.	IRIGM	SEISMOLOGY
	METRO	MAZINTER	TRANSPORT
	MARISONDES C	MET NAT	OCEANOLOGY
	COST 43 SOBA	MET NAT	OCEANOLOGY
	NIVOLOG.MET	MET NAT	HYDROLOGY
	FOCAL	MUS.HIST.NAT	OCEANOLOGY
	VAGSAT	ORCA INST.	TEST
	HYDROLOGY RPB	ORSTOM	HYDROLOGY
	ORSTOM L.H.N.	ORSTOM	HYDROLOGY
	MAREGRAPHES TOGAMAR	ORSTOM	OCEANOLOGY
	PLUIES CARAIBES	ORSTOM	METEOROLOGY
	ST PAUL	ORSTOM	METEOROLOGY
	MATEMSIS	ORSTOM	VULCANOLOGY
	BOUQUETINS MERCANTOURS	PARC NATIONAL DU MERC	BIOLOGY
	BOUEE SIGN.	PHAR&BALISE	METEOROLOGY
	SEINE COMPL	S.DE LA NAV/SEINE	HYDROLOGY
	MD/NAVI	TAAF	METEOROLOGY
	VERSEAU	UNIV MONTPELLIER	HYDROLOGY
	LAC KELUT	UNIV SAVOIE	VULCANOLOGY

Total = 36

ITALY

	BOA 1	ENEA	OCEANOLOGY
	PROGRAM NAZIONALE DI RIS	ENEA	METEOROLOGY
	EXPARGOS	NATO	OCEANOLOGY

Total = 3

JAPAN

	OCEAN INVEST PACIFIC O	FAR SEAS FISH. RES .	OCEANOLOGY
	SEA BEARS	FISHERIES AGENCY	BIOLOGY
	JAPAN SEA CURRENT	JAP HYDROGRAPHIC ASS	OCEANOLOGY
	KURUSHIO	MAR.SAFETY.AG.	OCEANOLOGY
	JARE	NIPR	METEOROLOGY
	POLAR PATROL BALL IN A	NIPR	METEOROLOGY
	ANT.SEALS & PENGUINS	NIPR	BIOLOGY
	GEOPHIS STAT. ANTARCT	NIPR	SEISMOLOGY
	RES.WARM.CUR	TOK.FISH LAB	OCEANOLOGY
	OVERALL RESE ON PRINC	UNIV OF TOKYO	OCEANOLOGY
	MIGR.STUD. CRANES	WILD BIRD SOCIETY	BIOLOGY

Total = 11

KOREA

	FISH.ACT.MONIT	FISH.ASSOCIATIONS	FISHERIES

Total = 1

NETHERLANDS			
	HOLLAND MARINE	ATO	POLLUTION
	COST 43 SOBA	R.N.MET.INST	OCEANOLOGY
	RHINE MONITO SYST	ROTTERDAM TELEPORT	TRANSPORT
Total = 3			
NEW ZEALAND			
	DRIFTING B.-TOGA	N.Z.MET.OFF	OCEANOLOGY
	AWS/DCS EVAL	N.Z.MET.OFF	METEOROLOGY
Total = 2			
NIGER			
	NIGER	UNPD	HYDROLOGY
Total = 1			
NORWAY			
	1990 NORTH POLE EXP		EXPEDITION
	SOBA NORWAY	CH.MICHELSEN	OCEANOLOGY
	WILD REINDEER NORWAY	DIR. NATURE MANGT	BIOLOGY
	FISH LARVAE	MAR.RES.INS.	BIOLOGY
	NOR.HYDROLOGY	NHL	OCEANOLOGY
	BREVIK	NHL	OCEANOLOGY
	SEANOR	NOR.MET.OFF	OCEANOLOGY
	NOROBS	NOR.MET.OFF	METEOROLOGY
	SEANOR	NOR.MET.OFF	OCEANOLOGY
	SEANOR	NOR.MET.OFF	OCEANOLOGY
	COST 43 SOBA	NOR.MET.OFF	OCEANOLOGY
	FIMBULISEN	NOR.POL.INST	OCEANOLOGY
	REINDEER PLAR BEAR TLTY	NOR.POL.INST	BIOLOGY
	ICE DRIFT EXPERIMENT	NOR.POL.INST	OCEANOLOGY
	REF.STATION	RNCSIR	TEST
	NORID	SINTEF	OCEANOLOGY
	DECS NORWAY	SPACETEC	TEST
	WAPAC	VERITAS OFFSHORE TECH	OCEANOLOGY
Total = 18			
PAKISTAN			
	ENV D.COL.SNOW WATER	WAPDA	HYDROLOGY
Total = 1			
PORTUGAL			
	ESSAIS PROPAG FH	CORREIOS & TELECOMUNI	RADIATION
	COST 43 PORTUGAL	INSTIT.NACIONAL METEO.	METEOROLOGY
Total = 2			
RFA			
	WINTER WEDDELL GYRE	A.WEGENER INST.POLAR	OCEANOLOGY
	ALT.ENERGY	DFVLR	METEOROLOGY
	ATM. + OCEAN PROC.	IMK	OCEANOLOGY
	GERMAN RAFOS	INST FUR MEERESKUNDE	OCEANOLOGY
	SWAN MIGRAT.	INST.NATURSCHUTZ	BIOLOGY

	WASSERMASSEN IM NORD.	UNIV HAMBOURG	OCEANOLOGY
	KIEL GEK BUOY	UNIV KIEL	OCEANOLOGY
	WARMWATER	UNIV KIEL	OCEANOLOGY
Total = 8			
S.AFRICA			
	SAWBEX	SAWB	METEOROLOGY
	AGULOBS	SAWB	OCEANOLOGY
	SPRING	SAWB	METEOROLOGY
Total = 3			
SAUDI ARABIA			
	ARABIYA ISLAND AWS	MEPA	METEOROLOGY
	PERS.GULF	MEPA	POLLUTION
Total = 2			
SPAIN			
	WAVESCAN	INST. NAC. METEOROLOGY	METEOROLOGY
Total = 1			
SWEDEN			
	SWED MET. ARGOS STATIO	SMHI	HYDROLOGY
Total = 1			
	WATER QUAL. MONIT.	FORTH RIVER BOARD	HYDROLOGY
	ODAS 20 (85)	MOUK	OCEANOLOGY
	SOBA UK	MOUK	OCEANOLOGY
	ODAS 451/452	MOUK	OCEANOLOGY
	BOFS	PLYMOUTH MARINE LAB	OCEANOLOGY
	SPERM WHALES	SEA MAM.R.U.	BIOLOGY
	DECCA NAV AND ARGOS	UNIV NORTH WALES	OCEANOLOGY
	HOUBARA BUSTARDS	UNIV OXFORD	BIOLOGY
Total = 8			
USA			
	OCEAN DRIFTER TRACKING	APPLIED SCIENCE ASSOC	POLLUTION
	SMITH BAY ICE MVT STAT	ARCTEC	OCEANOLOGY
	FARFIELD DRIFTER PROG	BATTELLE MEMORIAL	POLLUTION
	106 M DRIFT	BATTELLE OCEAN. SCI.	POLLUTION
	ARCHAEOLOGICAL STUDY	BUREAU OF LAND MNGT	LAW ENFOR.
	AMFIP BEHM CANAL	DAVID TAYLOR RES. CEN	OCEANOLOGY
	BERING/CHUKCHI SEA OCEAN	EXXON	OCEANOLOGY
	COOK INLET	EXXON	OCEANOLOGY
	ALASKAN POLAR BEARS	FISH & WILD	BIOLOGY
	SEA TURTLE TRACKING	FISH & WILD	BIOLOGY
	RCFMMB	FISH & WILD	BIOLOGY
	ALASK PORCUPINE CARIBOU	FISH & WILD	BIOLOGY
	ALASK.CARIBO	FISH & WILD	BIOLOGY
	ANIMAL TRACKING	FISH AND GAME ALASKA	BIOLOGY
	EDDY WATCH	HOR.MAR.INC.	OCEANOLOGY
	OIL & GAS PIPELINE	HOUSTON DATA TRANSM	POLLUTION

ASSEST OF LONG TERM	KINETIC LAB	OCEANOLOGY
IN-SITU PROD.ARRAY	LAMONT-DOHERTY	OCEANOLOGY
AUT. GEOPHY.OBSERV	LOCKHEED RES. LAB.	SEISMOLOGY
FRAS	MASSA. GEN.HOSPITAL	BIOLOGY
SOUNDING ROCKET	NASA	METEOROLOGY
WAVES AIR SEA INTERACT	NDBC	OCEANOLOGY
TOGA US	NDBC	OCEANOLOGY
TOGA US	NDBC	OCEANOLOGY
D.RAPID RESPONSE	NDBC	OCEANOLOGY
SEETNMB	NDBC	OCEANOLOGY
CMOD EVALUATION	NDBC	ENGINEERING
AIR SEA	NDBC	OCEANOLOGY
MOORED BUOYS	NDBC	OCEANOLOGY
HARBOR SEAL MVT	NMFS	BIOLOGY
DRIFT THERMISTOR CHAIN	NOAA	OCEANOLOGY
EQUATORIAL PACIFIC OCEAN	NOAA/AOML	OCEANOLOGY
EPOCS	NOAA/ERM	OCEANOLOGY
EPOCS	NOAA/ERM	OCEANOLOGY
EPOCS/TOGA ATLAS	NOAA/PMEL	OCEANOLOGY
FISHERIES OCEANO. COOP.	NOAA/PMEL	BIOLOGY
BEAUFORT & CHUKCHI SEAS	NOAA/PMEL	OCEANOLOGY
WOLF PREY RELATIONSHIPS	NORTH ROCKIES CONS	BIOLOGY
POINT SUR	NV.POSTGRAD.SCHOOL	OCEANOLOGY
AREA	PRL	OCEANOLOGY
RAMP	SANDIA NL	RADIATION
CALIF.FRONTS	SCRIPPS INST	OCEANOLOGY
LOC. ACC. ERROR SOURCES	SOUTHWEST RES. INST.	TEST
W.L.TRACKING	TELONICS	BIOLOGY
AUTONOMOUS LAGRANG CIR	UNIV CALIFORNIA	OCEANOLOGY
MIDDLE ATL COST.CURR	UNIV DELAWARE	OCEANOLOGY
NASSAU GROUPER LARVAL	UNIV FLORIDA	BIOLOGY
ACME	UNIV FLORIDA	BIOLOGY
HAWAII TIME-SERIES	UNIV HAWAII	BIOLOGY
MANATEE MOVEMENTS	UNIV OREGON	BIOLOGY
DEEP DRIFTER	UNIV RHOD.ISL..	OCEANOLOGY
UNIV S. MISSISSIPPI M.S.	UNIV S.MISSISSIPPI	BIOLOGY
COORD.ARCTIC BUOY	UNIV WASHINGTON	OCEANOLOGY
CIRCULATION & PARTICULES	UNIV WASHINGTON	OCEANOLOGY
ANTARTICA BUOY PROGRAM	UNIV WASHINGTON	OCEANOLOGY
ANTAR.AWS	UNIV WISCONSIN	METEOROLOGY
TIME SERIES TRAPPING	UNIV.MISSISSIPPI	OCEANOLOGY
MVT HABIT USE WILD	US ARMY	BIOLOGY
OFFSH SEA TURTLE TRACK	US DOC/NOAA/SEFC/NMF	BIOLOGY
MINNESOTA WOLF DISPERSAL	US FOREST SERV.	BIOLOGY
SEISMOLOGICAL OBS DATA	US GEOLOGICAL SURVEY	SEISMOLOGY
ELECTROMAGNET NOISE MEA	US N S W C	OCEANOLOGY
REMOTE CONTR WAVE-AIR	US NAVAL OCEANOG	OCEANOLOGY
OCEANIC INTERAC DRIFT	US NAVAL OCEANOG	OCEANOLOGY
ARCTIC/N.ATL DDBP	US NAVAL OCEANOG	OCEANOLOGY
USCG DRIF BU	USCG	POLLUTION
FISH.VESSELS	USCG	POLLUTION
SEA TURTLE	VIMS	BIOLOGY
WATCH	WILDLIFE INS	BIOLOGY

	RELAYS	WOODSHOLE INST	OCEANOLOGY
	URIP TELEM.PROJ.	WOODSHOLE INST	OCEANOLOGY
	SCOPEX	WOODSHOLE INST	OCEANOLOGY
	WEPOCS	WOODSHOLE INST	OCEANOLOGY
	REAL-TIME	WOODSHOLE INST	OCEANOLOGY
	AMASSEDS	WOODSHOLE INST	OCEANOLOGY
	SEDIMENT TRAP ARRAY	WOODSHOLE INST	OCEANOLOGY

Total = 76

TOTAL 216

APPROVED PROGRAMS SINCE MARCH 1989

	PROGRAM NAME	ORGANIZATION	FIELD
AUSTRALIA			
	ACT E&W	ACT ELECTRICITY & WAT.	HYDROLOGY
	HEARD ISLAND	AUST ANTARCTIC DIV	EXPEDITION
	MACQUARIE ISLAND	AUST ANTARCTIC DIV	EXPEDITION
	AUS SHIPBOARD PAB TRIAL	AUST.MET.OFF	OCEANOLOGY
	TIDE SEA LEVEL	AUST.MET.OFF	OCEANOLOGY
	ARTESIAN BASIN	BUR.MIN.RES.	HYDROLOGY
	MURRAY BASIN	BUR.MIN.RES.	HYDROLOGY
	CRABEATER SEALS	CSIRO	BIOLOGY
	CSIRO XBT	CSIRO	OCEANOLOGY
	HYDROMETRIC DAC	ENGIN & WATER SUP. DPT	HYDROLOGY
	MAGPIE GEESE	NAT PKS. & WILDLIFE	BIOLOGY
	PERS LOC BEACON	RAN	EXPEDITION
	GULF ST VINCENT WATER	S. AUST DPT OF FISH.	OCEANOLOGY
	OUTHERN OCEANOLOGY TIDE	UNIV. FLINFERS S.A.	OCEANOLOGY
	ADELIE PENGUINS PRYDZ	UNIV. MONASH	BIOLOGY
	HYDROLOGY DATA NETWORK	WATER RESOURCES COM	HYDROLOGY
Total = 16			
CANADA			
	BEAUFORD SEA	BEAUFORT SEA OIL	POLLUTION
	D.A.P	DEF.RES.ESTAB.ATLANTIC	OCEANOLOGY
	CNDA ICE ISLAND RES. STAT.	POLAR CONT. SHELF PJT	OCEANOLOGY
Total = 3			
FINLAND			
	FINNARP 89	UNIV HELSISKI	OCEANOLOGY
	SAIMAA RINGED SEAL PGM	UNIV OF JOENSUU	BIOLOGY
Total = 2			
FRANCE			
	CEA LOC PRECISE	CEA	SEISMOLOGY
	TRANSAMAZONIE TEST	CLS	EXPEDITION
	IEMVT	CLS	EXPEDITION

	RIJKSWATERSTAAT MBUOY	CLS	OCEANOLOGY
	AEROSTAT MARTIEN	CNES	TEST
	SURV OZONE STRATO	CNRS	AERONOMY
	MANCHOTS EMPEREUR	CNRS	BIOLOGY
	POISON	DOUANES FRANCAISES	POLLUTION
	MAREGRAPHES TOGAMAR	ORSTOM	OCEANOLOGY
	GASCOM 90	SHOM	OCEANOLOGY
	BELLE FRANCE	SUTTON GROUP	EXPEDITION
	INCLINO 1	UNIV CLERMONT	SEISMOLOGY
Total = 12			
JAPAN			
	EVEREST BALLOON	EV.BAL.EXP.COMM	METEOROLOGY
	TEST OF THE EFFECTIVENESS	FISHERIES AGENCY	BIOLOGY
	SOUTHERN MINK WHALES	INST.CETOCEAN RES.	BIOLOGY
	JAPAN SEA CURRENT	JAP HYDROGRAPHIC ASS	OCEANOLOGY
	HIROSHIMA CUP	MARINE & WEATHER	EXPEDITION
	POLAR PATROL BALLOON	NAT.INST.POLAR RES	AERONOMY
	KUROSHIO	UNIV OF KYUSHU	OCEANOLOGY
	CONT OBS MOOR CURRENT	UNIV TOKYO	OCEANOLOGY
	MON. MOORED BUOY	UNIV TOKYO	OCEANOLOGY
Total = 9			
KOREA			
	FISH.ACT.MONIT	FISH.ASSOCIATIONS	FISHERIES
Total = 1			
MALAISIA			
	LEATH.TURTLE MALAYSIA	DEPT FISHERIES	BIOLOGY
Total = 1			
NETHERLANDS			
	HOLLAND MARINE	ATO	POLLUTION
	DUTCH WARP	NETH.INST.OCEANIC RES	OCEANOLOGY
Total = 2			
NEW ZEALAND			
	WAVE BUOY PJT	BUXTON TUDER	OCEANOLOGY
	CURRENT METERING	BUXTON TUDER	OCEANOLOGY
	HELICOPTER LOCATOR	GREENPEACE	EXPEDITION
Total = 3			
NORWAY			
	1990 NORTH POLE EXP	NORTH POLE EXP	EXPEDITION
	DECS NORWAY	SPACETEC	TEST
Total = 2			
PAKISTAN			
	ENV D.COL.SNOW WATER	WAPDA	HYDROLOGY
Total = 1			

APPENDIX 4

SELECTED ARGOS USER CONFERENCE PAPERS

1989 NORTH AMERICAN ARGOS USER CONFERENCE & EXHIBIT
SAN DIEGO, CALIFORNIA, USA MAY 15 - 17, 1989

OPENING SESSION

Welcome Address
- A. E. Shaw III (Service Argos, Inc., USA)

Keynote Address
- Mr. George Delmas, Co-chairman of the Operations Committee (CNES, France)

IOC Representative
- P. Niiler (Scripps Institute of Oceanography, USA)

WMO Representative
- T. Bryan (NOAA, Office of Climatic and Atmospheric Research, USA)

Status of Argos in North America
- J.-L. Bessis (Service Argos, Inc., USA)

OCEANOGRAPHIC SESSION

Summary of the Joint Tariff Agreement and U.S. Programs
- T. Bryan (NOAA, Office of Climatic and Atmospheric Research, USA)

Lagrangian Drifters in the World Climatic Research Programme Project
- P. Niiler (Scripps Institute of Oceanography, USA)

CLS/Service Argos Oceanographic Products and Services
- C. Vassal (CLS/Service Argos, France)

U.S. Navy Tests of Sonobuoy-Size Environmental Data Buoys
- R. Pickett (ASW Oceanography Program Office, NORDA, USA)

Field Evaluation of Real-Time XBT Systems
- M. Szabados, D. Wright (NOAA/National Ocean Service, USA)

Real-Time Surface Currents from Moored Buoys
- P. Freitag, M. McPhaden, A. Shepherd (Pacific Marine Environmental Laboratory, NOAA, USA)

The Quality of Drifting Buoy Data: A Status Report
- F. Abell (National Data Buoy Center, USA)

Data Monitoring and Quality Control of Marine Observation
- P. Reilly, S. Richardson (NOAA/National Ocean Service, USA)

BIOLOGY SESSION

Use of Argos for Animal Tracking in the Rocky Mountain Region of North America
- D. Clark (Service Argos, Inc., USA)

Bird-borne PTT's
- P. Howey (H-Cubed, USA), W. Seegar (Department of the Army, Edgewood Arsenal, USA), M. Fuller (U.S. Fish & Wildlife Service, Patuxent Wildlife Research Center, USA)

Development of Argos PTTs for Application to Birds
- S. Tomkiewicz (Telonics, Inc., USA)

The Prospects for Tracking Pinnipeds at Sea Using the Argos Satellite System: Insights from Studies of Free-Ranging Harbor and Ringed Seals
- S. Leatherwood, B. Stewart, P. Yochem (Sea World Research Institute, Hubbs Marine Research Center, USA), M.-P. Heide-Jorgensen (Greenland Fisheries Research Laboratory, Denmark)

Tracking Harbor Seals in Southern California
- P. Boveng, A. Hohn, D. DeMaster, A. Dizon (NOAA, National Marine Fisheries Service, USA), D. Hanan, J. Scholl (California Department of Fish & Game, USA)

Three Years Operational Use of Satellite Transmitters on Florida Manatees: Tag Improvements Based on Challenges from the Field
- J. Reid, T. O'Shea (U.S. Fish & Wildlife Service, National Ecology Research Center, USA)

Integrating Satellite Telemetry with Traditional Wildlife Methods
- F. Harrington (Mount Saint Vincent University, Canada), Al Veitch (University of Minnesota, USA), Stu Luttich (Labrador Wildlife Division, Canada)

TECHNICAL ADVANCEMENT SESSION

Use of the Argos System
- M. Cazenave, A. Goasguen, J.-P. Boutes, R. Liaubet, L. Mesnier (CLS/Service Argos, France)

Efficient Utilization of the ARGOS Distribution System
- H. Sparks (Service Argos, Inc., USA)

Expansion Capabilities of PRL Drifting Buoys
- J. Anderson, S. Burke, M. Clarke, A. Magnuson (Polar Research Laboratory, Inc., USA)

Advanced D-Band DCLS/HRPT Earth Stations Developed
- D. Beaty (Telonics, Inc., USA)

Powerful Fixed-Location PTTs for Pakistan
- D. Farrell, L. Ross (Sutron Corporation, USA)

EOS Program Overview
- P. Backlund, L. Shaffer (Science Applications International Corporation, USA)

Real-time Applications of AVHRR Imagery and ARGOS-Relayed In Situ Data in the Antarctic and Along the California Coast
- R. Bernstein (SeaSpace, USA)

The Doris Project: another new direction for CLS/Argos
- M. Cazenave, R. Liaubet (CLS/Service Argos, France)

Argos in the 1990's
- M. Taillade (CLS/Service Argos, France)

1987 ARGOS INTERNATIONAL USER CONFERENCE AND EXHIBIT

GREENBELT, MARYLAND, USA SEPTEMBER 15 - 17, 1987

OPENING SESSION

Welcome Address
- A. E. Shaw III (Service Argos, Inc., USA)

Keynote Address - ARGOS: New Agreements, New Challenges
- Mr. Russ Koffler (NOAA/NESDIS, USA)

The United States Argos Processing Center (USAPC)
- J.-L. Bessis, H. Sparks, A. Shaw (Service Argos, Inc., USA)

World Meteorological Organization (WMO) Activities Relating to Service Argos
- J. Neilon (National Weather Service, NOAA, USA)

The Intergovernmental Oceanographic Commission (IOC) and Its Interest in the Argos System
- Y. Treglos (IOC, Switzerland)

United States Participation in the Argos Joint Tariff Agreement
- T. Bryan (NOAA, Office of Climatic and Atmospheric Research, USA)

OCEANOGRAPHIC SESSION

Application of Satellite-Tracked Drifters for Measuring Currents in the Great Lakes
- K. Miners, R. Murthy (National Water Research Institute, Canada), J. Campbell (NOAA, Satellite Research Laboratory, USA)

Three Ocean-Related ARGOS Applications
- R. I. Dempsey, J. Seiler (Seimac, Limited, Canada)

Drifting Buoy Management at the Responsible National Oceanographic Data Centre (RNODC)
- J. Keeley (Marine Environmental Data Service, Canada)

Real Time Quality Control of Drifting Buoy Data at the NOAA Ocean Products Center
- R. Barazotto, J. Lynch (NOAA/Ocean Products Center, USA)

Quality Control of Drifting Buoy Data
- D. Gilhousen (NOAA/National Buoy Data Center, USA)

The NOAA-AOML Drifting Buoy Program
- D. Bitterman (Atlantic Oceanographic & Meteorological Laboratory, NOAA, USA)

Expendable Bathythermograph for Acquisition, Processing, and Transmission of Sub-Surface Temperature Measurements via the Argos System
- B. Voituriez (Institut Francais de Recherche pour L'Exploitation de la Mer, France)

A Shipboard Argos Weather Station Using Loran to Compute True Winds Regardless of Ship Trajectory
- M. Reynolds (Coastal Climate Company, USA)

BIOLOGY SESSION

Wildlife Satellite Telemetry: A Progress Report, 1987
- S. Tomkiewicz, D. Beaty, J. Carter (Telonics, Inc., USA)

Development of a Sea Turtle Satellite Biotelemetry System
- R. Byles, U. S. Department of the Interior, USA)

Long term Tracking of Manatees through the Argos Satellite System
- B. Mate, M. Winsor (Oregon State University, USA), J. Reid (U.S. Fish & Wildlife Service, National Ecology Research Center, USA)

Tracking Barren-Ground Caribou by Satellite: The More the Need for PTTs, the Better they Work
- Al Veitch (University of Minnesota, USA), Stu Luttich (Labrador Wildlife Division, Canada)

Free-Ranging Movements of a Pilot Whale from a Satellite-Monitored Radio Tag
- B. Mate (Oregon State University, USA)

TECHNICAL ADVANCEMENT SESSION

French Satellite Based Remote Sensing: Current Status and Future Plans
- B. Nutten (CNES, France)

Description of a Local User Terminal for the Data Collection and Platform Location System
- R. Brown (Microlog Corporation, USA), R. Timko (NOAA/NDBC, USA)

The Argos Seismic Data Message System
- J. Derr (U. S. Department of the Interior, USA)

Glacier Motion by Telemetered Satellite Navigation Positions
- D. Trabant, U.S. Geological Survey, USA)

Satellite-Aided Recovery of Auroral Rocket Payload in Northern Alaska
- M. Silbert, NASA, USA), S. Fancy (U. S. Fish & Wildlife Service, USA)

The Geostar Environmental Moritoring Program
- M. Rothblatt (Geostar Corporation, USA)

High Accuracy ARGOS Location
- P.-Y. LeTraon (CLS/Service Argos, France)

Earth Observing System (EOS) Requirements for Data Collection and Location
- J. Turkiewicz (NASA, USA), P. Castruccio (Ecosystems International, Inc., USA), R. Wallace, (ORI, Inc., USA)

1986 ARGOS USERS CONFERENCE

GENEVA, SWITZERLAND OCTOBER 14 - 15, 1986

OPENING SESSION

Welcome Address
- Mr. Obasi (General Secretary, OMM, Switzerland)

The Future of ARGOS
- M. Taillade (CLS/Argos, France)

Argos in the USA: Policy and Development
- J.-L. Bessis (Service Argos, Inc., USA)

The New Argos Data Processing Center
- T. Babits (CLS/Argos, France)

A Summary of the US Programs
- T. Bryan (NOAA, USA)

OCEANOGRAPHIC SESSION

Drifting Buoy Development at the NDBC
- J. McCall (NDBC, USA)

TOGA Program
- K. Mooney (NOAA Headquarters, USA)

User and Efficiency of Argos Data for Marine Meteorology
- C. Billard (Meteorologie Nationale, France)

A Shipborne Automatic Weather Station
- M. Stromme (Bergen Ocean Data, Norway)

Drifting Buoy Activities in Saudi Arabia
- M. Romaith, A. Romaith (MEPA, Saudi Arabia)

Des Femmes pour un Pole: Description and Conclusions about the Scientific Experiment Done in the North Pole Area
- M. Griselin (University of Nancy, France)

BIOLOGY SESSION

Tracking of Whales in the Mediterranean Sea
- D. Viale (University de Corte, France)

Testing Argos Antenna for Animal Tracking
- J. Priede (University of Aberdeen, United Kingdom)

Application of System ARGOS for the Study of Onchocercosis in Africa
- M. Pouyaud (ORSTOM, France)

1985 ARGOS USER CONFERENCE

NEW ORLEANS, LOUISIANA, USA SEPTEMBER 24 - 25, 1985

OPENING SESSION

Welcoming Address
- J. McCall (Director, National Data Buoy Center, NOAA, USA)

Satellite Data Processing and Distribution for the Remainder of the 80's Decade
- W. Callicot (Office of Satellite Data Processing and Distribution, NOAA/NESDIS, USA)

Recent WMO Activities Relating to Service Argos
- J. Neilon (WMO Representative, International Affairs Staff, NOAA/NWS, USA)

Service Argos and IOC Interests
- R. Junghans (IOC Representative, International Activities Group, NOAA/OAR, USA)

Argos System: Present and Future
- M. Taillade (Service ARGOS, France)

New Distribution System, New Data Processing Centers
- A. Goasguen, T. Babits (Service ARGOS, France)

OCEANOGRAPHY SESSION

Argos Sea Trials
- L. Mesnier (Service ARGOS, France)

ENVIROSAT-2000: The Long-Range Outlook
- W. Hussey (NOAA/NESDIS, USA)

Shrimp Stock Assessment in French Guiana: The Argos System Utilization
-S. Duvivier, C. Dintheer, C. Leroy (IFREMER, France)

Operational Wind/Wave Buoy System Using Argos Telemetry
- M. Reynolds (Coastal Climate Company, Ltd.)

Stabilizing a Standard Drifter Hull for Wave-Spectral Measurements
- R. Pickett (Naval Ocean Research and Development Activity, USA), R. Miller, J. Lee (Woods Hole Oceanographic Institute, USA)

Performance of Low Cost Torpedo Drifter Tracking Agulhas Current
- P. Smith (Ferranti ORE, USA), J. Luyten (Woods Hole Oceanographic Institute, USA)

Ocean Wave Drifting Buoy
- M. Tsutsumi (Toyo Communication Equipment Company Ltd., Japan)

Cost Engineered Argos Mini-Drifter
- F. Wilem (Triton System, Inc., USA)

Communication Link Induced Data Anomalies
- R. Partridge, L. Clayton, P. Loescher (NDBC/NSTL, USA)

Requirements for a System To Receive Localized Near Real Time Drifting Buoy Data
- R. Garrard (Computer Sciences Corporation, USA)

METEOROLOGY/HYDROLOGY SESSION

Balloon Tracer for Acid Rain Aerosols
- E. Lichfield (Technadyne Engineering Consultants, Inc, USA), B. Zak, H. Church, M. Ivey (Sandia National Laboratories, USA)

Using Argos for Hydrological Studies of Coastal Swamps in French Guiana
- J.-M. Fritsch (ORSTOM, FRANCE)

Argos Position Accuracy from Four Years of Ice Buoy Observations
-C. Pease (NOAA/PMEL, USA), M. Reynolds (Coastal Climate Company, Ltd., USA)

BIOLOGY SESSION

A Brief Review of Wildlife Satellite Telemetry
- D. Beaty, S. Tomkiewicz (Telonics, Inc., USA)

1985 ARGOS USER CONFERENCE

KIEL, GERMANY MAY 21 - 23, 1985

OPENING SESSION

Welcoming Address
- Pr. Krauss (Institute fur Meereskunde an der Universitat, Kiel, Germany)

OCEANOGRAPHY SESSION

The Relationship Between Drifter Trajectories and Mean Seasonal Distribution of Wind and Baroclinic Ocean Current in the Eastern North Atlantic

- W. Emery (University of British Columbia, Canada)

System Argos, Sea Surface Temperatures and Circulation Pattern in the North Atlantic

- A. Cracknell (University of Dundee, Great Britain)

On the Correlation of Wind and the Trajectories of Drogued Drifting Buoys

-J. Stahlmann (Institut fur Meereskunde, Germany)

Technical Experience with the Argos System Transmission of Oceanographical Data

- S. Hansen (Oceanor, Norway)

The Importance of Measuring Current, Wave and other Environmental Parameters to Improve the Forcast Service

- S. Hansen (Oceanor, Norway)

The Current System of the North Atlantic as Deduced from Drifting Buoys

- Pr. Krauss (Institute fur Meereskunde an der Universitat, Kiel, Germany)

A New Wave Direction Buoy Allows Presentation of Wave Direction Data in Near Real Time

- G. Ueland (IKU, Norway)

Onboard Spectral Sea-State Analysis: The Spear/F Buoy Inputs to ERS1 Calibration and Validation Phase

- R. Ezraty (IFREMER, France)

METEOROLOGY SESSION

The Use of Space Techniques for Better Knowledge of Surface Currents in the Southern Oceans

- N. Daniault (Meteorologie Nationale, France)

The Norwegian Meteorological Institute Use of the Argos System

- C. Jensen (Norwegian Meteorological Institute, Norway)

A Drifting Buoy Experiment as Part of COST 43

-P. Blouch (Meteorologie Nationale, France)

POLAR REGIONS SESSION

Report on Ice Buoys in the Arctic and Antarctic

- N. Nergaard (The Christian Mickelsen Institute, Norway)

Experiences with Argos During MIZEX 83 and 84

- B. Farelly (University of Bergen, Norway)

The Use of the Argos System for Automatic Meteorological Data Collection in Greenland

-F. Jensen (Danish Meteorological Institute, Denmark)

Use of Argos PTTs on an Expedition to the North Pole

-M. Tervaskanto (High Arctic Consulting Ltd. Finland)

ENVIRONMENTAL STUDIES SESSION

Use of Argos System for Oceanography Data Acquisiton: Statistics and Forecasting

- S. Antalowsky (SYMINEX, France)

Description of the Norwegian Doppler Positioning Program

- P. Anderson (Norwegian Defense Reserach Establishment, Norway)

Preliminary Technical Evaluation of an Argos-Monitored Radio Tag for Tracking Manatees

-B. Mate (Oregon State University, USA)

Utilization of Argos at Ozone Measurement Stations

-K. Reiniger (DFVLR, Germany)

ARGOS AND THE FUTURE SESSION

Report of System Argos Utilization: Present and Future

- R. Rosso (Service Argos, France)

From Argos 1 to Argos 2: Extension and Follow-on

- D. Ludwig (CNES, France)

Technical Improvements for Argos: New Distribution System, New DP Centers

-A. Goasguen (Service Argos, France)

1984 ARGOS USER CONFERENCE

SEATTLE, WASHINGTON, USA MAY 21 - 23, 1984

OPENING SESSION

Welcoming Address

- Mr. Russ Koffler (NOAA/Office of Satellite Data Processing and Distribution, USA)

United States Programs Using Argos

- T. Bryan (NOAA, Office of Climatic and Atmospheric Research, USA)

OCEANOGRAPHIC SESSION

The Tropical Ocean and Global Atmosphere Program (TOGA)

- NOAA, Office of Climatic and Atmospheric Research, USA

Arabian Gulf Circulation

- R. Pickett, R. Partridge, J. Galt (NOAA/NDBC, USA)

A Report on the DRIFTERS Program

- R. Heinmiller (OMNET, USA), J. Masterson, J. McWilliams (National Center for Atmospheric Research, NOAA, USA)

Applications of the Argos System in the Equatorial Pacific Ocean/Atmosphere Interaction Studies

- P. Freitag, D. Halpern, A. Shepherd (NOAA/PMEL, USA)

Drifting Buoys in the Labrador Shelf

- W. Thompson, J. Buckley (Petro-Canada, Canada), D. Fissel (Arctic Sciences Ltd., Canada)

Moored Buoy Station Keeping and Location System

- R. Garrard (Computer Sciences Corporation, USA)

A New Versatile Argos PTT for Oceanographic Applications
- C. Roark (Synergetics International, USA), P. Smith, D. Frye (Ferranti O.R.E., Inc., USA)

Sea-ice Motion and Argos Measurements
- R. Colony (Polar Science Center, USA)

An Overview of the NDBC Drifting Buoy Program
- R. Kozak (NOAA, National Data Buoy Center, Stennis Space Center, MS, USA)

BIOLOGY SESSION

The Argos System Used for Tracking Gray Whales
- B. Mate (Oregon State University, USA)

TECHNICAL ADVANCEMENT SESSION

Overview of Data Processing at A.E.S. LUT
- W. Hume, H. Kagawa (Atmospheric Environment Service, Canada)

The Data Acquisition Control and Telemetry (DACT) System
- W. Serstad (Magnavox Electronics Systems, Co, USA)

Some Methods of Computing PTT Location Estimates
- C. Hoisington (Science Systems and Applications, Inc., USA)

1983 ARGOS USER CONFERENCE

LONDON, UNITED KINGDOM SEPTEMBER 27 - 28, 1983

OPENING SESSION

Welcome Address
- P. Bescond (Director of Satellite Operations, CNES, Toulouse, France)

Service Argos Report
- M. Taillade (CLS/Service Argos, France)

Studies into Location Accuracy
- Mr. Oyharcabal (CNES, France)

Positioning Accuracy of the Argos System in Operational Use
- Mr. Looyen (Ministry of Transportation and Public Works, Netherlands)

Phase Modulation Evaluation Procedure
- Mr. Levanon (Johns Hopkins University, USA)

OCEANOGRAPHIC SESSION

DB2 - DB3 The Next Generation
- Mr. Forsdyke (Thorn EMI Electronics, United Kingdom)

Development of a Lagrangian Drifting Buoy
- Mr. Kerut (NOAA/NDBC, USA), Mr. Wilson (Computer Sciences Corporation, USA)

Long Term Drifting Float
- Mr. Gascard, Mr. Jeanin (Laboratoire d'Oceanographie Physique, France), Mr. Ovarlez, (L.M.D., France)

Tracked Drifting in the Rockall Trough
- Mr. Meldrum, Mr. Booth, Mr. Ritchie (SMBA, United Kingdom)

Monitoring of Marine Environment
- Mr. Nergaard (The Christian Michelsen Institute, Norway)

Validation of Sea Surface Temperature
- Mr. Cairnie, Mr. Callison, Mr. Cracknell, Mr. Johnson (University of Dundee, United Kingdom)

Wave Directional Spectra
- Mr. Beco (Societe Nereides, France), Mr. Ezraty (CNEXO-COB, France)

Routine Wave and Meteorological Measurements in Offshore Areas
- Mr. Barstow (I.K.U., Continental Shelf Institute, Norway)

BIOLOGY SESSION

Motivation for Satellite Tracking of Southern Elephant Seals
- Mr. Bester (University of Pretoria, South Africa)

Tracking Humpback Whales in the North Atlantic
- Mr. Mate (Oregon State University, USA)

HYDROLOGY/SEISMOLOGY SESSION

Hydrometric Data Collection
- Mr. Rabbia (ORSTOM, France)

The Amazon Basin
- Mr. Garcia (DNAEE, Brazil)

Monitoring Microearthquakes
- Mr. Poupinet, Mr. Glot (Universite de Grenoble, France)

METEOROLOGY SESSION

Operational Buoy Network
- Mr. Jensen (Norwegian Meteorological Institute, Norway)

Availability of the Argos System Based on Orbital Characteristics
- Mr. Grooters (Royal Netherlands Meteorological Institute, Netherlands)

Danish Arctic Automatic Synoptic Weather Station
- Mr. Jensen (Danish Meteorological Institute, Denmark), Mr. Taagholt (Technical University of Lyngby, Denmark)

MARITIME SESSION

Checking on the Position of Navigation Marker Buoys
- Mr. Racape (Service Technique des Phares et Balises, France)

Data from BOC Yachts: A Significant Input into Southern Hemisphere Analysis
- Mr. Le Roux (South African Weather Bureau, South Africa)

Contribution of the NOAA-7 and -8 and ARGOS Partnership to White Tuna Fishing in the North-East Atlantic
- Mr. Legal (CNEXO Brest, France)

1982 ARGOS USER CONFERENCE

ANNAPOLIS, MARYLAND, USA DECEMBER 13 - 15, 1982

OPENING SESSION

Welcoming and Opening Address
- R. Koffler (NOAA/NESDIS, USA)

Geostationary Operational Environmental Satellite
- W. Callicot (NOAA/NESDIS, USA)

NOAA's Role in Support of Service Argos
- A. Shaw (NOAA/NESDIS, USA)

Service Argos Technical Report and Improvement
- A. Goasguen (Service Argos, CNES, France)

METEOROLOGY SESSION

Motion Picture of Tropical Circulation as Presented by Tropical Constant Level Balloon System
- A. Schumann, E. Lichfiled (NOAA/NCAR, USA)

Drifting Buoy Studies for Weather Applications
- E. Kerut (NOAA/NDBC, USA)

Antarctic Automatic Weather Stations
- C. Stearns (University of Wisconsin, USA)

Collecting Meteoroligical Reports with the Argos System
- E. Vockeroth, C. DiCenzo (Atmospheric Environment Service, Canada)

OCEANOGRAPHY SESSION

The FOCAL Drifter Program 1983-1984
- J. Gonella, M. Fieuz, A. Kartavtseff, G. Reverdin (Laboratoire d'Oceanographie Physique, France), C. Colin, Y DuPenhoat (ORSTOM, France)

The Deep Drifter Program
- T. Rossby, D. Dorson (University of Rhode Island, USA)

Comparison of Satellite-Derived Sea Surface Temperatures with Ships, Fixed Buoys, and Drifting Buoys
- A. Strong (NOAA/NESDIS, USA)

U.S. Programs Using the Argos Data Collection and Platform Location System
- T. Bryan (NOAA, USA)

Telemetered Meteorological and Engineering Data from a Deep Sea Moored Buoy in the Long Term Upper Ocean Study (LOTUS)
- C. Deser (Woods Hole Oceanographic Institute, USA)

BIOLOGY SESSION

Tracking Whale Migrations with the Argos Satellite System
- B. Mate (Oregon State University, USA)

OTHER UTILIZATIONS SESSION

The Argos Contribution to the Demonstration of the Effectiveness of a Satellite-Based Search and Rescue System
- R. Rolland (Service Argos, CNES, France)

Practical Considerations When Using Water Quality and Structure Monitoring Sensors as Applied to Portable Argos Satellite Transmitter Equipment
- R. Parker (Partech Electronics Ltd., United Kingdom)

EQUIPMENT SESSION

Drifting Buoy Development and Future Program
- M. Tsutsumi (Toyo Communications Co. Ltd., Japan)

Development of a Low Cost Drifting Buoy
- F. Guptill (Hermes Electronics Ltd, Canada), B. Thompson (Petro Canada, Canada)

1982 ARGOS USER CONFERENCE

PARIS, FRANCE APRIL 20-22, 1982

OPENING SESSION

Welcoming and Opening Address
- H. Curien (CNES, France), Y. Sillard (CNEXO, France)

Argos System Main Characteristics
- J.-L. Bessis (Service ARGOS, CNES, France)

System Status Report after 3 Years' Operation, Service ARGOS Policy
- M. Taillade (Service ARGOS, CNES, France)

OCEANOGRAPHY SESSION

Evaluation of Wave Energy Resources on the French Atlantic Seaboard
- M. Ollitrault, J.-M. Coudeville (CNEXO, France)

SINODE (Surface Indian Dynamics Experiment
- G. Reverdin, M. Fieux, J. Gonella (Physical Oceanography Lab, National Museum of Natural History, France)

The ARGOS Contribution to the FGGE Study of Drifting Buoy Trajectories
- N. Daniault (Center of Maritime Meteorology, National Department of Meteorology, France)

Main Features of Antarctic Ocean Circulation as Revealed by Satellite Tracking of Icebergs
- P. Tchernia (Physical Oceanography Lab, National Museum of Natural History, France)

WADIBUOY System and WADIAN E Wave Directional Analysis
- J.-M. Yung (NEREIDES, France)

METEOROLOGY SESSION

A Large-Scale Air-Sea Interaction Project Over the Pacific Basin
- R.-J. Fleming (US GARP Office, NOAA, USA)

Meteorological Buoys Developed at the E.E.R.M. Laboratory
- V. Klaus (Physical Oceanography Lab, National Museum of Natural History, France)

The ARGOS Contribution to the FGGE Study of Drifting Buoy Trajectories
- N. Daniault (Establishment for the Study and Research of Meteorology, National Department of Meteorology, France)

Atmosphere, Ice, Ocean Interactions in the Antarctic
- A. Poggi, H. Hallot, G. Wendler (Glaciology and Geophysic Laboratory of the Environment, CNRS, France)

ARGOS Communications Performance Trials
- J. Looyen (Data Processing Division of Rijkswaterstaat, Netherlands)

Location and Data Collection for Long Stratospheric Balloon Flights
- P. Malaterre (Balloon Division, CNES, France)

BIOLOGY SESSION

Development of ARGOS PTTs for Tracking of Basking Sharks (Cetorhinus Maximus)
- I.-G. Priede (Department of Zoology, University of Aberdeen, Great Britain)

Transatlantic Migration Study of the Leathery Turtle Using the Argos System
- M. Duron (National Museum of Natural History, France)

MARITIME APPLICATIONS SESSION

The Trans-Pacific Sailing Experiment by YASEIGO-3
- H. Ochiai (Toba Merchant Marine College, Japan)

The Argos Contribution to the Successful Dragging of a Deep-Moored Currentmeter
- J. Gonella (Laboratory of Oceanographic Physics, National Museum of Natural History, France), B. Ollivier (Orstom/TAAF, France)

Argos Aboard Research Vessels: 1981 Experiment Aboard the "Le Suroit" Oceanographic Vessel and the Outlook
- J.-P. De Longueau (Operations Naval Service, CNEXO, France)

Miscellaneous Argos Maritime Applications
- R. Rolland (Service ARGOS, CNES, France)

The Sinking of "Les Mutuelles du Mans" Trimaran
- M. Yokel (Maritime Expert, Les Mutuelles du Mans, France)

The SARSAT Program
- D. Ludwig (SARSAT, CNES, France)

HYDROLOGY SESSION

Measurement of Water Equivalent of Mountain Snow Cover
- P. Guillot (Technical Division, Electricity of France, France)

Hydrology and Climatic Conditions in Greenland
- N.-V. Soerensen (Groenlands Tekniske Organization, Denmark)

Hydrological Data Collection from Swedish Mountain Areas
- G. Wennerberg (The Swedish Meteorological and Hydrological Institute, Sweden)

The Argos System and Hydrology: the Use of PTTs with Built in Memory and Direct Reception by the Seine Basin Hydrology Service
- J. Callede (Hydrological Service, ORSTOM, France), J. Rentiere (Navigation of the Seine Service, France), Y. Rouquerol (Service Regional D'Amenagement des Eaux de la Region Parisienne, France)

Application of Remote Sensing Technique in Hydrological Studies in Malaysia
- M. Hasan (University of Malaya, Malaysia)

EQUIPMENT SESSION
Direct Readout and Dissemination of Results Using ARGOS Keypad Terminals
- D. Bernadet (CEIS Espace, France)

1981 ARGOS USER'S CONFERENCE
SAN FRANCISCO, CALIFORNIA, USA OCTOBER 28 - 29, 1981

OPENING SESSION
Welcoming and Opening Address
Presentation of Argos System - Improvements Brought About to the System Since 1978 and Statement on Future Developments
- A. Goasguen (Service ARGOS, CNES, France)

EQUIPMENT SESSION
A Modular Approach to the Design of Integrated Environmental Data System
- L. Duffield (Hermes Eelctronics Ltd., Canada)
New Directions in Argos Instrumentation at Polar Research Lab
- W. Brown, J. Anderson (Polar Research Lab, Inc., USA)
Fourier Transform of Wave Data on Argos Buoys
- W. Whitehead (Bristol Aeorspace Ltd, Canada)
The Edmonton Data Collection Platform Processing and Locating Facility
- C. Di Cenzo (Atmospheric Environment Service, Canada)
The Development of PTT and its Application for Drifting Buoys
- M. Tsutsumi (Toyo Communication Co. Ltd., Japan)

OCEANOGRAPHIC SESSION
Surface Currents in the Tropical Pacific During 1979-1980 Using Drifting Buoys
- W. Patzert (Scripps Institute of Oceanography, USA)
A Summary of US Program Using the Argos Data Collection and Platform Location System
- T. Bryan (NOAA, USA)
Future Inferences Drawn from Past and Present Applications of Drifting Buoys
- N. Boston (Beak Consultants Ltd, Canada)
GLACIOLOGY SESSION
Sea Ice Motion in Response to Geotrophic Winds
- R. Colony (Polar Science Center, USA)

A Study of Ice Edge Dynamics in the Bearing Sea in February and March, 1981
-M. Reynolds, C. Pease, A. Macklin (NOAA Pacific Environmental Lab, USA)

METEOROLOGY SESSION
US Program in Anchored Data Buoy and the Other Fixed Observation Platforms
- G. Hamilton (NOAA/NDBC, USA)
One Thousand Day in the Brine
-M. Stavropoulous, P LeRoux (Weather Bureau, South Africa)
Automatic Weather Stations in Antarctica
-M. Savage, C. Stearns (University of Wisconsin, USA), C. Teague (Stanford University, USA)
The 1981 Transatlantic Boat Race Contribution for Marine Meteorological Measurements
-R. Rolland (Service Argos, Toulouse, France)
The Development of an Automated Marine Meterological Data System
-R. Vockeroth (Atmospheric Environment Service, Canada)

HYDROLOGY SESSION
Automatic Hydrological Data Collection Facility Using Argos
- B. Fromantin (CEIS Espace, France)

BIOLOGY SESSION
Argos Utilization for Dolphin Tracking
- J. Jennings (NOAA, USA)
Polar Bear Telemetry Results from the Nimbus-6 System
- M. Taylor (University of Minesota, USA)

1981 ARGOS WORKSHOP

BERGEN, NORWAY MARCH 3 - 4, 1981

OPENING SESSION
Argos System Status Report
- J.-L. Bessis (Service ARGOS, CNES, France)
Access to the Argos System
- A. Goasguen (Service ARGOS, CNES, France)

EQUIPMENT SESSION
Equipment for the Argos System From Eidsvoll Electronics A.S.
- I. Nordby (Eidsvoll Electronics, Norway)
Argos VHF Direct Readout Mini-Station
- A. Monier (CEIS Espace, France)

OCEANOGRAPHY SESSION

Operational Experiences with the Argos System in Oceanography and Oil Spill Emergency Planning

Future Plans for the Use of the Argos System as a Component in Offshore Data Collection System

- B. Fossum, T. Audunson (Continental Shelf Institute, Norway)

Circulation Pattern of the North Atlantic, Part of the Warmwater Sphere Research Effort at the University of Kiel

- W. Krauss, J. Meincke (University of Kiel, W. Germany)

Proposed Use of System Argos with Data Buoys for Calibration of Thermal Infrared Imagery of North British Waters for Sea Surface Temperature Maps

- A. Cracknell, S. Singh (University of Dundee, Scotland, United Kingdom)

GLACIOLOGY SESSION

The Use of the Argos System for the Study of the Drift of Antarctic Icebergs

- F. Mauviel, M. Dhalluin (Icebergs for the Future, France)

METEOROLOGY SESSION

Some Experience from Argos Stations in the Open Sea

- C. Jensen (The Norwegian Meteorological Institute, Norway)

The Experiences of the Swedish Meteorological and Hydrological Institute with the Argos System

- C. Colliander (Swedish Space Corporation, Sweden)

Applications of Argos Data Collection System for Automatic Meteorological Observations in Arctic Regions

- C. Jensen (The Norwegian Meteorological Institute, Norway)

1980 ARGOS USER'S CONFERENCE

QUEBEC, CANADA OCTOBER 1-2, 1981

OPENING SESSION

The System Argos after Two Year's Operation

- J.-L. Bessis (Service ARGOS, CNES, France)

System Performance, Data Distribution and Technical Files

- A. Goasguen (Service ARGOS, CNES, France)

EQUIPMENT SESSION

Argos PTTs

- M. Peberay (Electronique Marcel Dessault, France)

Argos VHF Direct Readout Mini-Station and CML 80-MP Data Collection PTTs

- D. Bernadet (CEIS Espace, France)

METEOROLOGICAL SESSION

Project PAPA, the Integration of Drifting Buoy Data into an Operational Meterological Service
- D Bourque (Atmospheric Environment Service, Canada)

Application of the Argos Data Collection System in Arctic Regions
- F. Jensen (Danish Meteorological Institute, Denmark)

The Balsamine Experiment
- H. Ovarlez, D. Cadet (Laboratory of Dynamic Meteology, Denmark)

Mountain Barrier Baroclinity Effects on Surface Winds Along the Alaskan Arctic Coast
- T. Kozo (Tetra Tech Inc., USA)

OCEANOGRAPHY SESSION

Data Collection and Winter Ice Dynamics in the Beauford Sea
- R. Hoare, J. Mercer, S. dePaoli (Dome Petroleum Ltd, Canada)

Automatic Buoys to Assist Tuna Fishing Off the Azores
- G. Fialho (VRP Barros-Institut National de Recherches sur la Peche, Portugal)

EARTH SCIENCE SESSION

Report on the Panel Discussion Held During the Workshop on Data Collection Platform Networks
- J Fortin (University of Quebec, Canada)

The ARGOS System and Hydrology
- J. Callede (ORSTOM, France)

Hydrometric Telemetry in Canada
- I Reid, K. Davies, J. Clarke (Water Survey of Canada, Canada)

1979 ARGOS USER'S CONFERENCE

LANHAM, MARYLAND, USA SEPTEMBER 13 - 14, 1979

OPENING SESSION

The Argos System: Technical Data Concerning Orbits, Data Acquisition and Platform Location
- A. Goasguen (Service Argos, CNES, France)

The ARGOS System: Data Processing, Availability and Distribution of Results
- J.-L. Bessis (Service Argos, CNES, France)

The ARGOS System: Situation and Progress to Date
- M. Taillade (Service Argos, CNES, France)

Argos Data Distribution System
- G. Sans (CNES, France)

OCEANOGRAPHIC SESSION

Operational Use of Tiros/Argos System in International Ice Patrol
- J. Murray, C. Weir (U.S. Coast Guard Oceanographic Unit)

US Drifting Buoy Performance During FGGE
- E. Kerut, R. Kozak (NOAA Drifting Buoy Office, USA)

Preliminary Results of Gulf Stream Ring Tracking via Satellite-Tracked Drifters
- B. Blumenthal (US Naval Oceanographic Office, USA)

METEOROLOGICAL SESSION

Utilization of the Tiros-N Argos System for the Tropical Constant Level Balloon Experiment
- P. Julian, E. Lichfield (National Center for Atmospheric Research, NOAA, USA)

TECHNICAL ADVANCEMENT SESSION

Australian Operational Experience in Using the Argos System
- R. de la Lande (Australian Drifting Buoy Program, Bureau of Meteorology, Melbourne)

The Transpacific Experimental Sailing by "Yasei-Go III"
- H. Ochiai (Toba Merchant Marine College, Japan), H. Kodokawa (The Society of Ancient Pacific Cultures, Japan), S. Takeuchi (Remote Sensing Technology Center of Japan, Japan)

Presentation of Electronique Marcel Dassault and Argos Platforms
- M. Jeanjeau (Electronique Marcel Dassault Society, France)

Tiros N-Argos: Some Canadian Experience
- H. Wiebe (Dome Petroleum, Canada)

1977 ARGOS USER'S MEETING

PARIS, FRANCE NOVEMBER 2 - 3, 1977

Argos User's Working Group
Spacecraft Presentation
System Presentation
Performance
Processing

APPENDIX 5

MicroSat Launch Systems

One Harbour Square, Suite 220
3027 Marina Bay Drive
League City, TX 77573
(713) 334-4212 *(voice)*
(713) 334-3951 *(fax)*

30 April 1990

Dr. Ashok Kaveeshwar
President
STARSYS, Inc.
2000 K Street NW, Suite 610
Washington, DC 20006

Dear Dr. Kaveeshwar:

MicroSat Launch Systems (MicroSat) looks forward to working with STARSYS, Inc. to provide launch services for your STARNET spacecraft. As you know, our launch system is currently being developed in conjunction with several major aerospace firms who are highly experienced in the area of launch systems and launch operations.

As we have discussed under our confidentiality agreement, MicroSat has plans to provide a vehicle designed to ideally suit the launch needs of the STARSYS planned STARNET system. Further, MicroSat is confident that the vehicle will be able to provide reliable operations within your proposed budget and timeframe. Because MicroSat's pricing scheme and vehicle designs are at this time proprietary we are not able to divulge in a public document detailed information. We look forward to working together to successfully implement this important and timely system.

Sincerely,

Peter H. Diamandis
President and C.E.O.

MEMORANDUM OF UNDERSTANDING

between

STARSYS, Inc. (STARSYS)

and

MicroSat Launch Systems, Inc. (MicroSat)

Whereas STARSYS, Inc., has interests in;

1) Establishing a low-Earth orbit constellation of 24 STARNET spacecraft to provide communications and positioning information services;
2) Identifying a low cost and reliable launch provider for 24 launches to implement the STARNET system and services;
3) Identifying a launch capability able to provide the required launches in a prompt and efficient period in the 1994 to 1995 time frame;
4) Identifying a launch capability that will be able to service the STARNET spacecraft constellation to replace individual satellites as required in a rapid and low-cost fashion; and,
5) Entering into an arrangement with a low-cost provider of launch services.

And Whereas MicroSat Launch Systems, a privately owned launch company, has interests in:

1) Providing low-cost reliable access to low-Earth orbit for microsatellite payloads;
2) Providing a vehicle ideally suited to meet the launch needs of the STARNET spacecraft;
3) Providing payload integration of the STARNET spacecraft into the MicroSat launch vehicle;
4) Providing low-Earth orbit launch services for the lowest per-launch cost available; and,
5) Launching the STARNET spacecraft on a dedicated basis and in a timely manner which complies with the needs of STARSYS, Inc., to implement the STARNET system.

Be It Resolved Therefore that STARSYS, Inc. and MicroSat will enter into negotiations to agree upon:

1) A price to be paid MicroSat for the low-Earth orbit launch services;
2) The weight and size of the payloads to be launched;
3) Mission parameters such as orbital altitude and lifetime;
4) A schedule of payments to MicroSat for the launch services;
5) A time period within which the launch will take place;
6) A date for delivery of the STARSYS, Inc., payloads to the launch site; and,
7) Such other terms and conditions as may be appropriate.

The undersigned hereby acknowledge this **Memorandum of Understanding** this 30th day of April, 1990.

Peter H. Diamandis
President and C.E.O.
MicroSat Launch Systems

/s/Ashok Kaveeshwar
Ashok Kaveeshwar
President
STARSYS, Inc.

APPENDIX 6

CERTIFICATE OF INCORPORATION

OF

STARSYS, Inc.

1. The name of the corporation is STARSYS, Inc.

2. The address of its registered office in the State of Delaware is Corporation Trust Center, 1209 Orange Street, in the City of Wilmington, County of New Castle. The name of its registered agent at such address is The Corporation Trust Company.

3. The nature of the business or purposes to be conducted or promoted is:

To engage in any lawful act or activity for which corporations may be organized under the General Corporation Law of Delaware. In particular, the corporation will apply to secure authorization to build, launch and operate a satellite system to serve the U.S. public interest, including compliance with the requirements of the Communications Act of 1934.

4. The total number of shares of stock which the Corporation shall have authority to issue is 10,000, comprised of one class of Class A Common Stock consisting of 500 shares, with a par value of $1.00 per share, and one class of Class B Common Stock consisting of 9,500 shares, with a par value of $1.00 per share. The designations and the powers, preferences and rights of the Class A Common Stock and the Class B Common Stock shall be as follows:

(i) The voting power solely for the election of directors shall be vested as provided in this subparagraph (i). The holders of the Class A Common Stock shall be entitled to 20 votes for each share of Class A Common Stock standing in the name of such holder upon the books of the Corporation. The holders of the Class B Common Stock shall be entitled to one vote for each share of Class B Common Stock standing in the name of such holder upon the books of the Corporation.

(ii) Except as provided in subparagraph (i) above, the entire voting power shall be vested as provided in this subparagraph (ii). The holders of the shares of the Class A Common Stock shall be entitled to one vote for each share of Class A Common Stock standing in the name of such holder upon the books of the Corporation. The holders of the shares of the Class B Common Stock shall likewise be entitled to one vote for each share of Common Stock standing in the name of such holder upon the books of the corporation.

(iii) The holders of the shares of Class A Common Stock and Class B Common Stock shall be entitled to participate ratably, according to the respective number of shares of stock held by them and without preference of any class over the others, in such dividends, if any, as from time to time in the discretion of the Board of Directors may be declared and made payable out of funds legally available therefor; except that, in any distribution with respect to Common Stock or right to acquire Common Stock (whether by stock dividend, distribution of rights, recapitalization or otherwise), only Class A Common Stock (or rights to acquire Class A Common Stock) will be distributed with respect to Class A Common Stock and only Class B Common Stock (or rights to acquire Class B Common Stock) will be distributed with respect to Class B Common Stock.

(iv) In the event of any dissolution, liquidation or winding up of the Corporation, the holders of the shares of Class A Common Stock and Class B Common Stock shall share ratably, according to the number of shares of Common Stock held by them, in any payment or distribution of the net assets of the Corporation available for distribution to its stockholders.

(v) Except as set forth in this paragraph 4, the Class A Common Stock and the Class B Common Stock shall be identical in all respects and shall have the same designations, powers, preferences and rights.

5. The name and mailing address of each incorporator is as follows:

NAME	MAILING ADDRESS
Archie E. Shaw III	2817 Glen Isle Road Riva, Maryland 21140
Raul Rodriguez	2000 K Street, N.W. Suite 600 Washington, D.C. 20006

6. The corporation is to have perpetual existence.

7. At all elections of directors of the corporation, each stockholder shall be entitled to as many votes as shall equal the number of votes which (except for such provision as to cumulative voting) he would be entitled to cast for the election of directors with respect to his shares of stock multiplied by the number of directors to be elected by him, and he may cast all of such votes for a single director or may distribute them among the number to be voted for, or for any two or more of them as he may see fit.

8. Elections of directors need not be by written ballot unless the by-laws of the corporation shall so provide.

Meetings of stockholders may be held within or without the State of Delaware, as the by-laws may provide. The books of the corporation may be kept (subject to any provision contained in the statutes) outside the State of Delaware at such place or places as may be designated from time to time by the board of directors or in the by-laws of the corporation.

9. The corporation reserves the right to amend, alter, change or repeal any provision contained in this certificate of incorporation, in the manner now or hereafter prescribed by statute, and all rights conferred upon stockholders herein are granted subject to this reservation.

10. A director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director except for liability (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the Delaware General Corporation Law, or (iv) for any transaction from which the director derived any improper personal benefit.

We, THE UNDERSIGNED, being each of the incorporators hereinbefore named, for the purpose of forming a corporation pursuant to the General Corporation Law of the State of Delaware, do make this certificate, hereby declaring and certifying that this is our act and deed and the facts herein stated are true, and accordingly have hereunto set our hands this 2nd day of May, 1990.

Archie E. Shaw III

Raul Rodriguez

APPENDIX 7

NACLS CATALOG OF PRODUCTS & SERVICES

ARGOS 16 PAGE BROCHURE