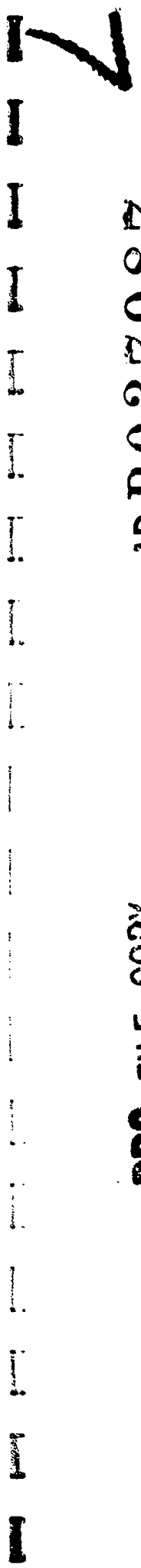


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FINAL REPORT, 21 Nov 1976 - 31  
CONTRACT NO. (15) N00014-77-C-0082 / December 1978.

(11) 30 April 1979

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Prepared for:  
Long Range Acoustic Propagation Project  
Department of the Navy  
Naval Ocean Research and Development Activity  
NSTL Station, MS 39529

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Prepared by:  
Xonics, Inc.  
6849 Hayvenhurst Avenue  
Van Nuys, California 91406  
(213) 787-7380

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## 1.0 INTRODUCTION

Xonics provided continuous technical services to Director, Long Range Acoustic Propagation Project (LRAPP) from 1 November 1976 through 31 December 1978 under Contract N00014-77-C-0082 and Modifications P00001 through P00007. The work was conducted by Xonics Oceans Systems Division under the direction of Mr. Sidney Kulek, Executive Vice President and General Manager of Xonics. Section 2.0 of this report provides a description of the work performed under the basic contract and each modification thereof and Section 3.0 provides a financial summary of the contract modifications.

## 2.0 DESCRIPTION OF TECHNICAL EFFORT

### A. Basic Contract

Xonics provided technical support services to LRAPP under the basic contract during the period 1 November 1976 through 30 July 1977 on the CHURCH STROKE ONE Exercise. Two major tasks were performed as follows:

Task 1 - Dr. W. Williams served as CHURCH STROKE ONE Exercise Director and directed the execution of the at-sea phase of the exercise from the Exercise Control (EXCON) Center in accordance with the Exercise Plan. Xonics prepared the Test Completion Report and distributed it in accordance with instructions from Director, LRAPP.

Task 2 - Xonics prepared, reproduced and distributed the CHURCH STROKE ONE Exercise Plan which detailed the technical objectives, technical plan, operations plan, and data acquisition, communications and contingency procedures.

### B. Modification P00001

Under this modification, Xonics provided technical support services to the Director, LRAPP from March 1977 through October 1977. The following three major tasks were performed:

Task 1 - Xonics prepared the CHURCH STROKE ONE Data Analysis Plan that detailed data reduction and analysis procedures, established

priorities, assigned technical responsibilities, and defined schedules and reporting.

Task 2 - Xonics developed a set of statistical measures of effectiveness for the LAMBDA system; employed these measures of effectiveness in assessing potential impact of array tilt and array heading errors on the acoustic performance of LAMBDA; and using the above analysis, Xonics established limits on the allowable array buoyancy errors and nonacoustic sensor specifications.

Task 3 - Xonics provided technical support to LRAPP during pre-operation phases of the LAMBDA program in planning, coordinating, monitoring and documenting LAMBDA program activities.

C. Modification P00002

Under this modification, Xonics continued to provide technical services to the Director, LRAPP from June 1977 through December 1977. The effort consisted of the following task:

Task 1 - Xonics prepared an input for the CHURCH STROKE ONE Quick Look Report continuing a preliminary summary of the exercise operations, a preliminary revised master event schedule, and preliminary ship and aircraft track charts. In addition, Xonics prepared an input for the CHURCH STROKE ONE Synopsis Report.

D. Modification P00003

Under this modification, Xonics provided technical support concerning the LAMBDA Program during the period September 1977 through December 1977. The following three tasks were performed:

Task 1 - Dr. W. Williams assisted the CHURCH STROKE ONE Cruise 1 Chief Scientist and Principal Investigators onboard the ship during Cruise 1.

Task 2 - Xonics prepared the CHURCH STROKE TWO Cruise 2 Exercise Plan; Mr. Carl F. Morey served as Exercise Director and directed exercise operations from EXCON; and Xonics prepared and distributed the Test Completion Report for Cruise 2.



Task 3 - Xonics initiated conceptualization of the Cruise 5 measurement exercise for CHURCH STROKE TWO, coordinated the planning of the scientific teams and initiated Cruise 5 operations planning.

E. Modification P00004

Under this modification, Xonics continued to provide technical support to LRAPP concerning the LRAPP program during the period November 1977 through March 1978. The effort included the following tasks:

Task 1 - Xonics prepared and distributed the CHURCH STROKE TWO Cruise 5 Exercise Plan.

Task 2 - Dr. W. Williams served as Chief Scientist directing the technical and scientific effort on the M/V SEISMIC EXPLORER for CHURCH STROKE TWO Cruise 5.

Task 3 - Xonics coordinated the preparation and presentation of the CHURCH STROKE TWO Cruise 5 Hot Wash-Up.

F. Modification P00005

Under this modification, Xonics provided technical support to LRAPP concerning the LAMBDA program during the period February 1978 through December 1978. The effort consisted of the following task:

Task 1 - Xonics served as CHURCH STROKE TWO Analysis Director, developed analysis objectives and priorities, recommended analysis teams, provided technical assistance to the Data Analysis Plan preparation team, the Synopsis Report preparation team, and the Environmental Acoustics Summary Report preparation team concerning their reporting efforts. Xonics also monitored analysis progress and served as a member of the CHURCH STROKE TWO Technical Advisory Board.

G. Modification P00006

Under this modification, Xonics continued to provide technical services for the LAMBDA CHURCH STROKE TWO Program during the period of September 1978 through December 1978. This effort included the following task:

Task 1 - Xonics re-structured the CHURCH STROKE TWO Synopsis Report due to changing report requirements, lack of anticipated data submissions and alterations in actual operations due to adverse weather conditions. The Synopsis Report prepared by Xonics contained a detailed summary of exercise operations and preliminary results of the data analyzed.

H. Modification P00007

This was an administrative modification, there was no technical effort associated with it.

3.0 FINANCIAL SUMMARY

Table I presents a financial summary of Contract N00014-77-C-0082 by task and modification number.

Table I. Contract No. N00014-77-C-0082 Financial Summary

<u>Modification Number</u>	<u>Task Description</u>	<u>Amount Funded</u>
Basic	LAMBDA Measurement Program and Exercise Plan	\$ 69,186
P00001 A	CHURCH STROKE ONE Data Analysis Plan	32,187
B	Statistical Measures of Effectiveness for LAMBDA System	18,175
C	Technical Support to LRAPP During Preoperations Phase of LAMBDA Program	49,338
P00002 D	Quick Look Report and Synopsis Report	31,934
P00003 E	{ Report on Cruise 1 of CHURCH STROKE TWO Prepare Exercise Plan for Cruise 2 of CHURCH STROKE TWO Cruise 5 Measurement Exercise for CHURCH STROKE TWO	49,325
P00004 F	{ Exercise Plan for CHURCH STROKE TWO Cruise 5 Overview of Cruise 5 Operations	76,916
P00005 G	Report on Progress of Analysis Efforts Draft CHURCH STROKE TWO Data Analysis Plan Draft CHURCH STROKE TWO Synopsis Report	75,000
P00006 H	CHURCH STROKE TWO Synopsis Report	37,192
P00007	Administrative	-
	Total	\$439,253





**DEPARTMENT OF THE NAVY**

OFFICE OF NAVAL RESEARCH  
875 NORTH RANDOLPH STREET  
SUITE 1425  
ARLINGTON VA 22203-1995

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31 Jan 06

MEMORANDUM FOR DISTRIBUTION LIST

Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT  
(LRAPP) DOCUMENTS

Ref: (a) SECNAVINST 5510.36

Encl: (1) List of DECLASSIFIED LRAPP Documents

1. In accordance with reference (a), a declassification review has been conducted on a number of classified LRAPP documents.
2. The LRAPP documents listed in enclosure (1) have been downgraded to UNCLASSIFIED and have been approved for public release. These documents should be remarked as follows:

Classification changed to UNCLASSIFIED by authority of the Chief of Naval Operations (N772) letter N772A/6U875630, 20 January 2006.

DISTRIBUTION STATEMENT A: Approved for Public Release; Distribution is unlimited.

3. Questions may be directed to the undersigned on (703) 696-4619, DSN 426-4619.

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## Declassified LRAPP Documents

Report Number	Personal Author	Title	Publication Source (Originator)	Pub. Date	Current Availability	Class.
Unavailable	Unavailable	SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS. FINAL REPORT OF BEARING STAKE TESTS JANUARY THRU MARCH 1977. VOLUME IVB. DATA POINTS 10, 11 AND 12 RAW DATA ANALYSIS OF ACOUSTIC BOTTOM INTERACTION IN BEARING STAKE (U)	Sanders Associates, Inc.	790109	ADC017579	U
ARL/TR7924	Mitchell, S. K., et al.	REPORT FOR CHURCH STROKE II OCEANOGRAPHIC SERVICES	University of Texas, Applied Research Laboratories	790223	ADE001369; NS; ND	U
TTU1886502F	Eichenberger, D.	FINAL REPORT, 1 NOVEMBER 1976-31 DECEMBER 1978	Texas Instruments, Inc.	790326	ADB036751; ND	U
Unavailable	Unavailable	PREMOBILIZATION OF R/V INDIAN SEAL	Xonics, Inc.	790430	ADB037987	U
Unavailable	Mitchell, T. M.	ACODAC AMBIENT NOISE PROGRAM	Texas Instruments, Inc.	790531	ADB039703	U
Unavailable	Hays, E. E.	INTRODUCTION TO THE LRAPP ENVIRONMENTAL-ACOUSTIC DATA BANK (U)	Woods Hole Oceanographic Institution	790601	ADB040404	U
LRAPPR79029	Unavailable	MEASUREMENTS ON AQUADYNE MODEL AQ-1 ELEMENTS FOR THE UPGRADED LAMBDA ARRAY	Naval Ocean R&D Activity	790601	ADB041066; NS	U
USRD NO. 4807	Unavailable	SUMMARY OF ENVIRONMENTAL ACOUSTIC DATA ANALYSIS	Naval Research Laboratory	790802	ND	U
Unavailable	Ellis, G. E.	TAP III FINAL REPORT (U)	University of Texas, Applied Research Laboratories	790814	ADA073876	U
BR U0048-9C2	Unavailable	OPTIONS, REQUIREMENTS, AND RECOMMENDATIONS FOR AN LRAPP ACOUSTIC ARRAY PERFORMANCE MODEL (U)	Bunker-Ramo Corp. Electronic Systems Division	790901	ND	U
OR/IR1245	Moses, E. J.	EVALUATION OF STANDARD OCEAN CANDIDATES ENVIRONMENTAL ACOUSTIC SUPPORT FOR FLEET OPERATIONS AND NATO	ORI, Inc.	790917	NS; ND	U
Unavailable	Colborn, J. G., et al.	SUMMARY OF ENVIRONMENTAL ACOUSTIC MEASUREMENTS, MODELING AND ANALYSIS	Pacific-Sierra Research Corp.	800301	ADA087304	U
Unavailable	Kirby, W. D.	SURFACE DUCT, ROUGH SURFACE SCATTERING, AND CUSPED CAUSTIC IMPROVEMENTS FOR FACT	Science Applications, Inc.	801112	ADB052623	U
Unavailable	Unavailable	WIND-GENERATED NOISE MODELING	University of Texas, Applied Research Laboratories	801215	ADB053770	U
Unavailable	Renner, W. W., et al.	TOWED ARRAY PERFORMANCE PREDICTION SYSTEM - VERSION 1.2	Science Applications, Inc.	810301	ADA126250	U
Unavailable	Wilson, J. H.	FINAL REPORT	Science Applications, Inc.	810401	ADA190143	U
Unavailable	Goit, E. H.		Science Applications, Inc.	810701	ADB059397	U
3	Unavailable		University of Texas, Applied Research Laboratories	810721	ND	U