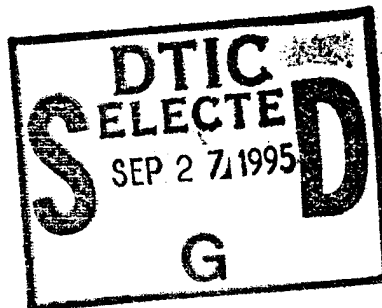


RDA-TR-1290001-001

**NON-ACOUSTIC ANTI-SUBMARINE WARFARE
FINAL REPORT FOR THE PERIOD COVERING
1 September 1990 through 31 October 1992
VOLUME 1**

By:
Dennis Holliday

APRIL 1995



Contract No. N00014-90-C-0223

Sponsored By:
Department of the Navy
Office of Naval Research
800 North Quincy Avenue
Arlington, VA 22217-5660

LOGICON

RDA

LOGICON RDA ■ POST OFFICE BOX 92500 ■ LOS ANGELES, CALIFORNIA 90009
6053 WEST CENTURY BOULEVARD ■ LOS ANGELES, CA 90045 ■ TELEPHONE: 310 645-1122

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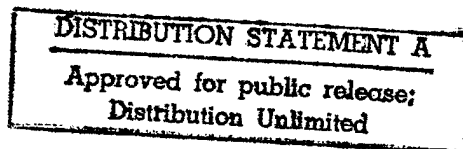


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I. INTRODUCTION

The work reported in this Final Report was performed under Item No. 0005 on p. 2 of ONR Contract No. N00014-90-C-0223 between the start date of September 1, 1990, and October 31, 1992. The work was conducted in general accordance with Tasks 4 and 5 of Section 2 of the Logicon R&D Associates (LRDA) Proposal No. 9000-1006 entitled *Proposed Research on Non-Acoustic Anti-Submarine Warfare*, dated May 1990. These tasks are:

- TASK 4: As funds are available, we will perform research relating to detection algorithms, performance assessments, and countermeasure development as directed by the Sponsor.
- TASK 5: Perform advisory activities pertaining to radar ocean imaging and detection as directed by the Sponsor.

Under the above tasks and under the direction of the Contracting Officer's Technical Representative, Mr. Richard Lauer, two technical documents were prepared and a number of meetings were prepared for and attended. This activity is described below.

The total amount of the contract was \$254,677. The total amount invoiced by LRDA was \$71,582 for the period of performance ending 31 October 1992.

II. DOCUMENTS PRODUCED

Two documents were produced under Item No. 0005 at the request of the Contracting Officer's Technical Representative, Mr. Richard Lauer, and delivered to him. These are included in the Classified portion (Vol. 2) of the Final Report as Appendix I and Appendix II.

Appendix I comprises the report titled *Planning for Future NAASW Research and Experimentation (U)* and dated 16 October 1990 combined a critique of NAASW Program Plans in place before LRDA was placed under contract with recommendations for

modifying and/or augmenting those plans. This document was produced after discussions with Mr. Lauer, other contractors in the program, and after reading program planning documents.

Appendix II comprises an evaluation dated 2 October 1991 of the report titled *Low Grazing Angle Radar Research at the Institute of Radiophysics and Electronics in Kharkov (U)*, as well as the transmitting cover letter written to Mr. Lauer by Dr. Dennis Holliday, the author of the report.

III. MEETING AND TRAVEL ACTIVITY SUPPORTED BY THE CONTRACT

Appendix III is a list of meeting and travel activity supported by the Contract under Item No. 0005.

IV. SPENDING HISTORY

Figure 1 shows the spending history of the Contract. After mid-October 1991 no additional funds were expended.

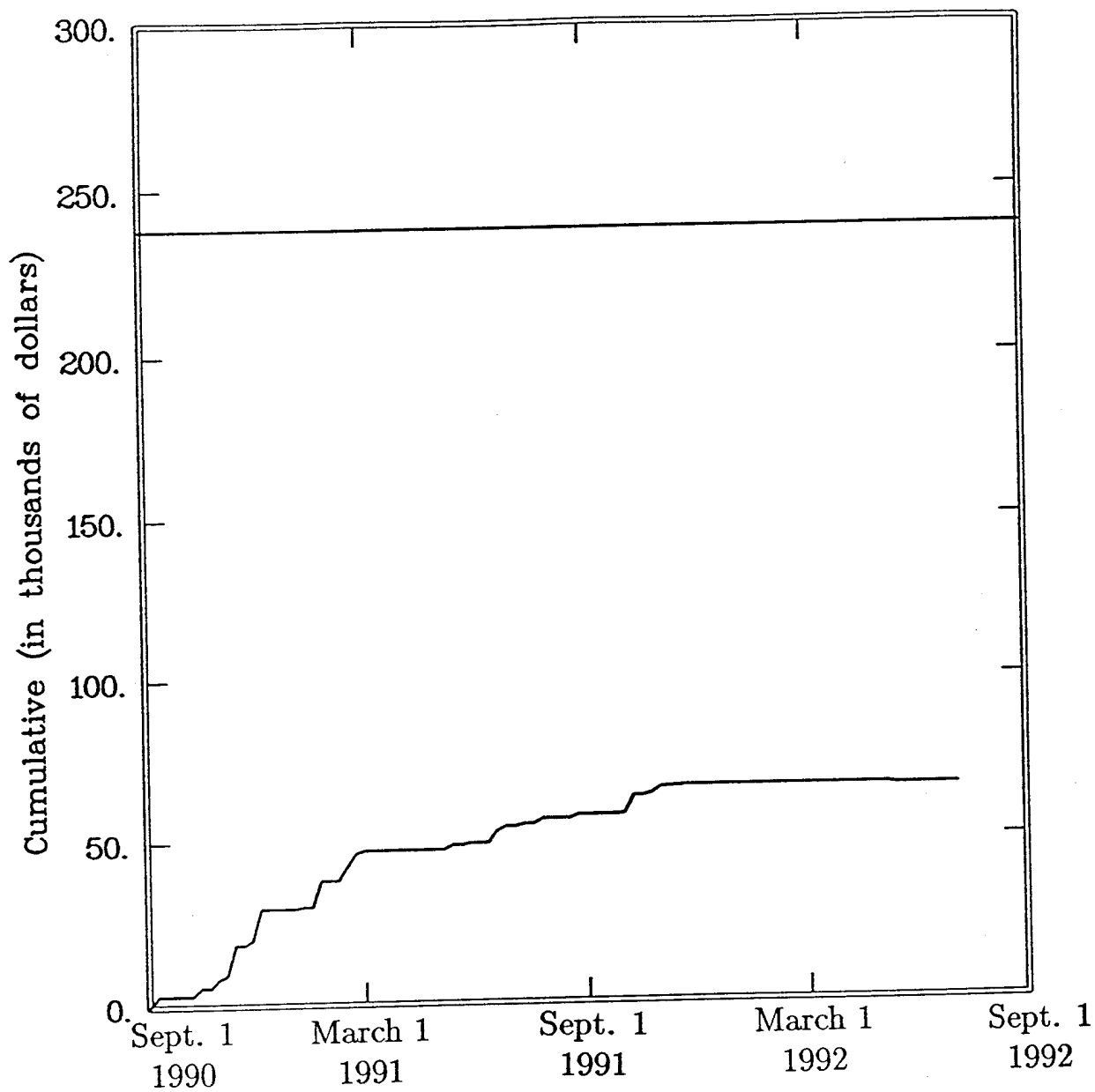


Figure 1. Spending history.

**APPENDIX I: PLANNING FOR FUTURE NAASW
RESEARCH AND EXPERIMENTATION**

(See Volume 2, p. 3)

**APPENDIX II: AN EVALUATION OF THE
REPORT "LOW GRAZING ANGLE RADAR
RESEARCH AT THE INSTITUTE OF
RADIOPHYSICS AND ELECTRONICS
IN KHARKOV"**

(See Volume 2, p. 11)

APPENDIX III: LIST OF MEETING AND TRAVEL ACTIVITY

1990

- Jun 25-27: Drs. D. Holliday, L. DeRaad, and G. St-Cyr participated in the Standard Leopard 1 Meeting held at Areté, Sherman Oaks, CA (Host: Norman T. Camp). Since funding for the Non-Acoustic ASW program was delayed, the trip was financed by our Ocean Imaging program, sponsored by DUSD.
- Aug 27-28: Dr. D. Holliday participated in the Standard Leopard Meeting presented at JHU/APL (Host: R. Gasparovic)
- Aug 29: Dr. Holliday participated in the Science Committee Meeting hosted by Areté, Crystal City, MD (Host: Tom Bell)
- Oct 02-04: Dr. D. Holliday participated in the Technical Review Meeting (TRG) at Areté, Sherman Oaks, CA (Host: Mike Lents)

1991

- Feb 05-07: Drs. D. Holliday, L. DeRaad, and G. St-Cyr participated in the Standard Leopard Quarterly Review Meeting presented at TRW, Redondo Beach (Host: Bruce Lake)
- May 29-31: Dr. L. DeRaad participated in the Standard Leopard NA-17 Quarterly Review Meeting held at JHU/APL, Laurel, MD (Host: Jerry Wagner)
- Jun 30-Jul 03: Dr. G. St-Cyr attended a symposium, "Progress in Electromagnetic Res. Symposium (PIERS) 1991," at MIT Cambridge, MA, with Prof. J.A. Kong
- Sep 11-12: Drs. D. Holliday, L. DeRaad, and G. St-Cyr participated in the Standard Leopard NA-17 Review Meeting at Dynamics Technology, Torrance, CA (Host: Dave Mantrom)