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ANOMALOUS ABSORPTION

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Principal Investigator

MANAGEMENT REPORT

30 September 1980 thru 31 December 1980

Sponsored by  
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Program Code Number NR 006-120

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Contract Expiration Date: 30 September 1981  
Amount of Anomalous Absorption Contract: \$434,299

Scientific Officer: Director, Acoustic Program  
Office of Naval Research  
Department of the Navy  
800 North Quincy  
Arlington, Virginia 22217

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  The primary objective of the Anomalous Absorption program is to observe and correlate in a quantitative manner the anomalous, frequency dependent acoustic absorption caused by fish and fish larvae with the type and abundance of the fish and larvae population as determined by net hauls. Such a characterization of the absorption will allow tactical sonar performance prediction to draw on fisheries surveys of regional productivity		

as a data bank for prediction of anomalous absorption in the mobile passive sonar band. Cooperative support has been offered by the National Bureau of Fisheries for the program by way of ship time on the DAVID STAR JORDAN for deploying and recovering the buoy systems and in collecting and supplying net haul data at the buoy stations during the data collection period. The scope of the program includes the design, fabrication and testing of the automatic data collection buoy system in the first year, followed by a two year program of data collection in the southern California current.



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## Marine Physical Laboratory

## ANOMALOUS ABSORPTION

## MANAGEMENT REPORT

30 September 1980 thru 31 December 1980

**RESEARCH PROGRAM AND PLAN**

The primary objective of the Anomalous Absorption program is to correlate in a quantitative manner the anomalous frequency dependent acoustic absorption caused by fish and fish larvae with the type and abundance of the fish and larvae population as determined by net hauls. Such a characterization of the absorption will allow tactical sonar performance prediction to draw on fisheries surveys of regional productivity as a data bank for prediction of anomalous absorption in the mobile passive sonar band. Cooperative support has been offered by the National Bureau of Fisheries for the program by way of ship time on the DAVID STARR JORDAN for deploying and recovering the acoustic buoy systems and in collecting and supplying net haul data at the buoy stations during the data collection period. The scope of the program includes the design, fabrication and testing of the automatic data collection buoy system in the first year, followed by a two year program of data collection in the southern California current.

**MAJOR ACCOMPLISHMENTS**

All major and long lead time components have been procured in sufficient numbers for completion of the first buoy set and fabrication of two more full sets, including spares.

Minor changes have been made to the transmitter, receiver, and transponder circuits.

Production of transducers for three buoys sets is 25% complete.

All component parts for the battery packs for the transmitters, receivers and transponders have been fabricated. Battery pack assembly is 20% finished.

The release mechanisms have been 50% completed.

All circuit cards for the remainder of the first set of receivers are fully assembled. Checkout of the boards is 25% complete. Fabrication of the support assembly for the receiver electronics is 50% complete.

Printed circuit layout for the transponders is 50% complete.

An extra set of transmitter electronics, without the power amplifier, is being assembled for use in receiver hardware checkout and software testing. This simulator is 75% complete.

#### FUTURE PLANS

Final plans are being made for an operational deployment during April, 1981. In contrast to the August, 1980 checkout trip, this one will involve a full buoy set, including three receivers. It will be the first tryout of handling procedures aboard the DAVID STARR JORDAN. It will also be the first operational test of the full receiver software.

Major software functions which were not included previously and which must be operational for the April trial are:

1. Pulse acquisition (i.e., synchronization of the receiver to the transmitter clock). This module has now been defined and is being coded.
2. Acoustically commanded tape playback and repositioning. These were written and partially checked out but were omitted in August because the playback hardware did not work correctly. The hardware has been fixed, and the software does not present significant problems.
3. Shipboard checkout system software. This is the remaining major development hurdle. The problem is to decide what constitutes an adequate verification of operation, and how to present this information to the operator. Coding will then be relatively simple.

In addition, the AGC did not work correctly in the August checkout. This will be investigated and corrected when the signal simulator is completed (planned for early February).

A hardware documentation report, including an evaluation of the April deployment, will be completed during 3rd. quarter FY81.

Completion of the second and third buoy sets is scheduled for the 4th. quarter FY81.

The fourth buoy set will be completed during 1st. quarter FY82.

Three deployments for data collection during FY81 will be followed by six to seven deployments during FY82. Data analysis will proceed during the same time frame, with preparation of a final report scheduled for 4th. quarter FY82.

STATUS

- (1) Amount currently provided in contract  
\$434,300
- (2) Expenditures and commitments to date  
\$271,536
- (3) Estimated funds required to complete the work  
\$162,764
- (4) Estimated date of completion of work  
30 September 1981

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