

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour 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 Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 1998		2. REPORT TYPE		3. DATES COVERED 00-00-1998 to 00-00-1998	
4. TITLE AND SUBTITLE High Frequency Acoustic Testbed				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Woods Hole Oceanographic Institution, Department of Applied Ocean Physics and Engineering, Woods Hole, MA, 02543				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES See also ADM002252.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 2	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

High Frequency Acoustic Testbed

James C. Preisig
Dept. of Applied Ocean Physics and Engineering
Mailstop #11
Woods Hole Oceanographic Institution
Woods Hole, MA 024543
phone (508) 289-2736
fax (508) 457-2194
email jpreisig@whoi.edu
Award Number: N00014-98-1-0429

LONG TERM GOALS

The long term goals are two-fold. The first is to develop an improved understanding of how acoustic signals propagate through the ocean and how this propagation effects the characteristics of received acoustic signals. The second goal is to use the improved understanding to develop more capable signal processing algorithms by incorporating the knowledge of the propagation phenomena into the algorithm development process. The signal processing applications on which I am currently focusing include underwater acoustic communications and navigation.

OBJECTIVES

The objective of this work is to develop a High Frequency Acoustic Testbed for the transmission, reception, processing ,and storage of acoustic signals in coastal ocean environments. The testbed will be:

- 1) highly capable in terms of signal transmission, reception, on-board processing, and storage,
- 2) flexible and easily programmable to accommodate a wide range of experimental requirements, and
- 3) easily deployable for experiments in a variety of environments.

APPROACH

The approach is to use the preexisting Utility Acoustic Modem (UAM) as the basis of the signal transmission, reception, and processing platform. This will save significant effort when writing software to run experiments on the acoustic testbed by taking advantage of the software already available for the UAM. Data collection capability will be enhanced by the addition of more reception channels and real-time data storage capability will be added by interfacing an IDE Hard Disk to the UAM. Flexible deployment in coastal environments will be realized by the modification of a lightweight coastal buoy/mooring system previously developed at WHOI. Realtime remote control and monitoring of the system will be accomplished by the integration of an off the shelf RF serial modem. Signal transducers and hydrophore arrays will be acquired and integrated into the system.

WORK COMPLETED

The required modifications to the buoy/mooring system have been specified and are underway. The RF modems have been specified and ordered. The hard disks have been purchased and integration is 95% complete. The transducers and hydrophore arrays have been specified.

IMPACT, APPLICATIONS AND TRANSITIONS

The testbed system is expected to be operational in mid-spring 1999. It will have an immediate impact on the development of underwater acoustic communications algorithms for the MURI AOSN program (N00014-95-1-1316) by allowing sustained signal transmission and measurement capability in coastal environments. It will also provide the same capability to the proposed Very Shallow Water/Surf Zone Acoustic Communications and Navigation program which is expected to begin in the spring of 1999. Additional future programs requiring the ability to transmit, receive and store acoustic signals in coastal environments will be able to benefit from the testbed.

RELATED PROJECTS

Low cost modular telemetry for coastal time series data (N00014-98-1-0816) and Moored Array technology (N00014-95-1-0346). These two programs funded the development of the lightweight coastal buoy/mooring system which will be modified for use in the High Frequency Acoustic Testbed.

MURI AOSN (N00014-95-1-1316) This program funded the development of the UAM which will be modified and then integrated with other components to fulfill the signal transmission, reception, processing and storage functions of the testbed. In addition, one of the first applications of the testbed will be the support of ongoing research on the development of new acoustic communications methodologies which is part of the AOSN program.