

REPORT DOCUMENTATION PAGE					Form Approved OMB No. 0704-0188	
The public reporting burden for this 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 the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 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 any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.						
1. REPORT DATE (DD-MM-YYYY) 31-August-2010		2. REPORT TYPE Final Performance Report			3. DATES COVERED (From - To) 1 September 2009 - 31 August 2010	
4. TITLE AND SUBTITLE Final Performance Report ARL Support of NRL Rocket Experiments to Investigate Ionospheric Phenomena				5a. CONTRACT NUMBER N00173-09-1-G036		
				5b. GRANT NUMBER N00173-09-1-G036		
				5c. PROGRAM ELEMENT NUMBER		
				5d. PROJECT NUMBER		
6. AUTHOR(S) Garner, Dr. Trevor W.				5e. TASK NUMBER		
				5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Applied Research Laboratories The University of Texas at Austin P. O. Box 8029 Austin, TX 78713-8029					8. PERFORMING ORGANIZATION REPORT NUMBER TL-SGL-10-02	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Naval Research Laboratory Code 6700 4555 Overlook Ave. S.W. Washington, DC 200375 Attn: Craig Selcher, Code 6754					10. SPONSOR/MONITOR'S ACRONYM(S)	
					11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for Public Release; Distribution is Unlimited						
13. SUPPLEMENTARY NOTES						
14. ABSTRACT						
15. SUBJECT TERMS N/A						
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 2	19a. NAME OF RESPONSIBLE PERSON Dr. Trevor W. Garner	
a. REPORT UNCLASS	b. ABSTRACT UNCLASS	c. THIS PAGE UNCLASS			19b. TELEPHONE NUMBER (Include area code) 512-835-3664	

**TL-SGL-10-02
31 August 2010**

FINAL PERFORMANCE REPORT

Period of Performance: 1 September 2009 – 31 August 2010

GRANT N00173-09-1-G036

**ARL Support of NRL Rocket Experiments to
Investigate Ionospheric Phenomena**

BY

DR. TREVOR W. GARNER

**APPLIED RESEARCH LABORATORIES
THE UNIVERSITY OF TEXAS AT AUSTIN
P. O. BOX 8029
AUSTIN, TX 78713-8029**

20100928194

OBJECTIVE

Applied Research Laboratories, The University of Texas at Austin (ARL:UT), proposed to operate the Coherent Ionospheric Doppler Receivers (CIDRs) in the NorthEast CIDR Array (NECA) in support of two Naval Research Laboratory (NRL) rocket experiments to be launched from the Wallops Island Test Facility. NECA is a network of CIDRs that includes a receiver at Wallops Island, Virginia and Millstone Hill, Massachusetts. Each rocket carried a dual-frequency VHF/UHF radio beacon onboard the rocket. ARL:UT was to provide equipment trouble-shooting and data processing for these experiments.

WORK PERFORMED

Of the two NRL rocket experiments, the first was launched on 17 September 2009. ARL:UT traveled to Wallops Island for this test. There the ARL:UT PI (Dr. Trevor Garner) participated in all of the preflight drills, launch simulations, and test runs. Additionally, Dr. Garner tested the Wallops CIDR and updated some of the CIDR software. When the rocket was launched on 17 September, Dr. Garner initiated the rocket tracking code, and the CIDR initially locked onto the rocket's beacon. Unfortunately, the CIDR software was not prepared to operate on the flight telemetry data provided by the WITF, and the CIDR failed to track one minute after launch. Thus, the CIDRs did not provide any useful data for the CARE rocket mission. The CIDR software was modified to prevent this problem from happening in the future. In addition, Dr. Garner participated in two after-action CARE reports. One immediately after the rocket experiment and a second held at Millstone Hill roughly a month afterwards.

Dr. Garner was informed by Dr. Paul Bernhardt in January 2010 that the second rocket experiment was canceled. Upon seeking direction for the reallocation of the funds under this project, Drs. Bernhardt and Garner agreed to reallocate the funds to support NRL's ongoing efforts to develop an ionospheric tomography network in South America to support the C/NOFS satellite mission. Under this work, Dr. Garner provided CIDR-C/NOFS observations of the ionosphere with the CIDR located in Ancon, Peru to Dr. Matt Hei of NRL, discussed the future designs of the South American tomography receiver chain with Dr. Hei, and developed an automated data delivery script for the Ancon station to have the data delivered directly to the LISN data server. This funding also partially supported Dr. Garner's participation at the International Beacon Symposium and the Coupling, Energetic and Dynamics of Atmospheric Regions (CEDAR) meetings.

NEW FINDINGS

None

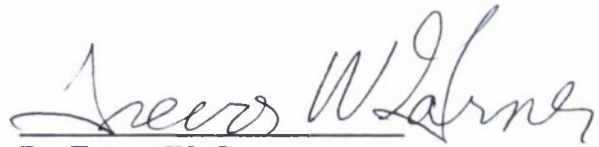
PERSONNEL SUPPORTED: Research Associate and Research Technician

PUBLICATIONS: None

INTERACTIONS: Dr. Garner participated in the CARE experiment as a part of the NRL team and interacted with several of other scientists and team members. He also discussed CIDR operations and data flow with members of the LISN network and NRL CERTO beacon team.

NEW DISCOVERIES: None

HONORS/AWARDS: None

A handwritten signature in cursive script, reading "Trevor W. Garner". The signature is written in dark ink and is positioned above a horizontal line.

Dr. Trevor W. Garner
Research Associate