SENSOR PROTOTYPE SYSTEM

David J. Gallant

Boeing LTS, Inc.
PO Box 5670
Albuquerque, NM 87185

January 2004

Final Report

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

AIR FORCE RESEARCH LABORATORY
Directed Energy Directorate
3550 Aberdeen Ave SE
AIR FORCE MATERIEL COMMAND
KIRTLAND AIR FORCE BASE, NM 87117-5776
Using Government drawings, specifications, or other data included in this document for any purpose other than Government procurement does not in any way oblige the U.S. Government. The fact that the Government formulated or supplied the drawings, specifications, or other data, does not license the holder or any other person or corporation; or convey any rights or permission to manufacture, use, or sell any patented invention that may relate to them.

This report has been reviewed by the Public Affairs Office and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nationals.

If you change your address, wish to be removed from this mailing list, or your organization no longer employs the addressee, please notify AFRL/DELS, 3550 Aberdeen Ave SE, Kirtland AFB, NM 87117-5776.

Do not return copies of this report unless contractual obligations or notice on a specific document requires its return.

This report has been approved for publication.

//signed//

MATTHEW MULLINS
Project Manager

//signed//

KIRK M. KLOEPPEL, Lt Col, USAF
Chief, Tactical Laser Branch
Directorate

//signed//

L. BRUCE SIMPSON, SES
Director, Directed Energy
Sensor Prototype System

David J. Gallant

Boeing LTS, Inc.
P.O. Box 5670
Albuquerque, NM 87185

AFRL/DELS
3550 Aberdeen Ave SE
Kirtland AFB NM 87117-5776

Approved for Public Release; Distribution is Unlimited.

This report summarizes the technical activity provided under task order 0014 of the SLIDERS contract. This task provided for continued research and development, and on-going operations support for the sensor program.

Mid-Infrared, Semiconductors, Lasers

Matthew Mullins
(505) 846-8160

i
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2.0 TECHNICAL ACTIVITIES</td>
<td>2</td>
</tr>
<tr>
<td>3.0 CONCLUSIONS</td>
<td>3</td>
</tr>
</tbody>
</table>
1.0 INTRODUCTION

The SLIDERS contract encompassed several research efforts within the Semiconductor Laser Branch of the Laser Division, Directed Energy Directorate of the Air Force Research Laboratory. The scope of this contract included development, design, fabrication, procurement, management, operations and maintenance of optical, electronic, and mechanical systems, subsystems, and components. Principal efforts included theory and concept development, design analysis, laboratory operations, and semiconductor laser and diode-pumped laser development, operation and maintenance. Efforts also included the development, procurement, and operation of instrumentation to evaluate and characterize laser systems.

The objective of task 0014 under the SLIDERS contract was to provide for continued research and development on a new sensor system and for on-going operation and maintenance support. Efforts supported the DELS branch of the Directed Energy Directorate at the Air Force Research Laboratory.
2.0 TECHNICAL ACTIVITIES

Task 14 was a continuation of the sensor project. This task involved lab operation and maintenance, in theater maintenance of units, including training of subcontractors for in field maintenance, and new site surveys as required. A new prototype system was partially developed in the lab under this task and was ultimately deployed to building 774, Kirtland AFB, for additional environmental and lifetime testing.

Progress on this task was slowed due to lack of funding and due to technical issues. During the research and development phase of building up the new prototype unit, the environment control unit selected for the new system enclosure developed several severe failures. A trip to the environment control unit manufacturing facility and discussions with the manufacturer’s engineering staff ultimately resolved the failure mechanism.

To facilitate testing of the new prototype, a test instrumentation shed was completed by construction contractors and inspected by CE. Base CE later installed power to the shed. The new prototype system was installed, aligned and left running for data collection. A new security system was engineered and developed for the 774 area. When fully implemented the security system will include video surveillance and dial-up capabilities on alarm.

The customer we are working with visited the lab to inspect the progress of the new system. He expressed satisfaction with the improvements made to the system.

Documentation of the mechanical, optical, electronics and electrical systems continue to be an on-going endeavor.
3.0 CONCLUSIONS

This task provided for continued research and development, and on-going operations support for the sensor program. We made significant progress in building up the new system and are currently testing it under various conditions at KAFB. Further efforts are required to fully test the system and to deploy it in a remote field location.
DISTRIBUTION LIST

DTIC/OCP
8725 John J. Kingman Rd, Suite 0944
Ft. Belvoir, VA 22060-6218 1 cy

AFRL/VsIL
Kirtland AFB, NM 87117-5776 2 cys

AFRL/VSIH
Kirtland AFB, NM 87117-5776 1 cy

Official Record Copy
AFRL/DELS/Matthew Mullins 3 cys