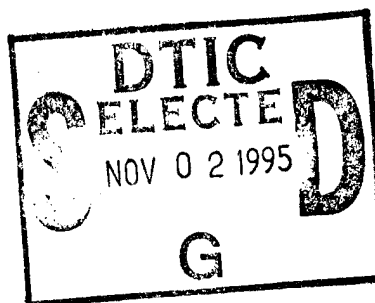


Silicon Mountain Design

27 January 1995

Office of Naval Research
Attn: William Miceli, ONR 313, Program Officer
Ballston Tower One
800 North Quincy Street
Arlington, VA 22217-5660

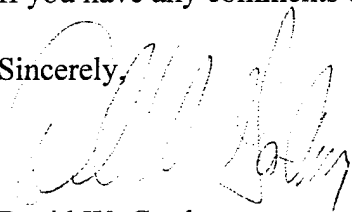


Reference: Contract N00014-94-C-0241
"An Ultra-High Speed Incoherent-to-Coherent Converter
for Optical Computing"

In accordance with contract data requirements, enclosed is the monthly status report for the period 1 January - 31 January 1995.

If you have any comments or questions you may contact me at (719) 576-4800.

Sincerely,


David W. Gardner
Program Manager

Encl.

Copy to: DCMAO Denver
Director, Naval Research Laboratory, Code 2627
Defense Technical Information Center (2)
Ballistic Missile Defense Organization - T/IS

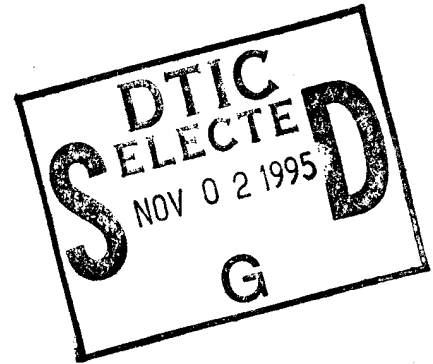
Letter only to: DCMO COS

DISTRIBUTION STATEMENT A

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Distribution Unlimited

Office of Naval Research
Arlington, VA
Contract N00014-94-C-0241

Monthly Status Report
January 1 - January 31, 1995



DESCRIPTION

Many optical computing problems are centered around the processing of incoherent images. These images may be conventional visible light such as those taken with a CCD imager or camcorder. They may also take the form of infrared images in the case of missile seekers or x-ray images from medical or other sources. For optical processing, these images must be converted to either phase or amplitude modulated coherent light. This is typically accomplished by electronically feeding the originally captured image into a spatial light modulator (e.g., liquid crystal or deformable mirror array) and modulating a coherent reference beam with the 2 dimensional data pattern. The electrical input to the SLM creates a data flow bottleneck in the optical processing system due to the inherently serial input architecture. SMD has proposed a novel incoherent to coherent image converter which solves this problem by providing a massively parallel, optical input feed capability. The proposed architecture utilizes a novel combination of micromachining and ultra-thinned wafer technology to achieve an integrated incoherent to coherent image converter. The converter is capable of directly converting UV, IR, visible, and x-ray energy to a coherent light representation allowing for maximum utilization of downstream optical processing.

JANUARY ACTIVITIES

During January, photomasks needed to pattern the micromachined gratings and addressing circuitry were fabricated. Prior to mask fabrication, additional test structures were added to the circuit design which will allow us to more accurately characterize key components of the SLM design. These structures included: single pixels which can be driven directly with an external voltage stimulus, addressing circuitry which can be driven and measured directly, and simple FET test structures to evaluate transistor performance in the ultra thin silicon. Device fabrication will begin in the next few weeks.

TO GO ACTIVITIES

SLM fabrication will begin by mid February 1995. Test fixturing for evaluation of the final devices will also be implemented during this time. Initial testing of the incoherent to coherent converter array will begin in mid to late February.

PROBLEMS/CONCERNS

None

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SCHEDULE/BUDGET

Device fabrication is currently about two weeks delayed; however, no impact to the overall program completion is anticipated. The program is within budget.

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DTIC TAB	<input type="checkbox"/>
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OFFICE OF THE UNDER SECRETARY OF DEFENSE (ACQUISITION)
DEFENSE TECHNICAL INFORMATION CENTER
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ALEXANDRIA, VIRGINIA 22304-6145

IN REPLY
REFER TO

DTIC-OCC

SUBJECT: Distribution Statements on Technical Documents

TO: OFFICE OF NAVAL RESEARCH
CORPORATE PROGRAMS DIVISION
ONR 353
800 NORTH QUINCY STREET
ARLINGTON, VA 22217-5660

1. Reference: DoD Directive 5230.24, Distribution Statements on Technical Documents, 18 Mar 87.

2. The Defense Technical Information Center received the enclosed report (referenced below) which is not marked in accordance with the above reference.

STATUS REPORT
N00014-94-C-0241
TITLE: AN ULTRA-HIGH SPEED
INCOHERENT-TO-COHERENT
CONVERTER FOR OPTICAL
COMPUTING

3. We request the appropriate distribution statement be assigned and the report returned to DTIC within 5 working days.

4. Approved distribution statements are listed on the reverse of this letter. If you have any questions regarding these statements, call DTIC's Cataloging Branch, (703) 274-6837.

FOR THE ADMINISTRATOR:

1 Encl

GOPALAKRISHNAN NAIR
Chief, Cataloging Branch

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The cited documents has been reviewed by competent authority and the following distribution statement is hereby authorized.

A

(Statement)

OFFICE OF NAVAL RESEARCH
CORPORATE PROGRAMS DIVISION
ONR 353
800 NORTH QUINCY STREET
ARLINGTON, VA 22217-5660

(Controlling DoD Office Name)

(Reason)

DEBRA T. HUGHES
DEPUTY DIRECTOR
CORPORATE PROGRAMS OFFICE

(Controlling DoD Office Address,
City, State, Zip)

Debra T. Hughes
(Signature & Typed Name)

(Assigning Office)

19 SEP 1995

(Date Statement Assigned)