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 **Micrion**

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June 10, 1992

Dr. Martin Peckerar
Naval Research Laboratories
Code 6804
4555 Overlook Drive SW
Washington, DC 20375-5000

Dear Marty:

This is the 15th bimonthly report detailing work done on contract N00014-89-C-2238 during April and May 1992.

3.31 Advanced Column Development

Essentially column development is complete except for continued lifetime testing. There have been no changes to optical elements in the final column.

3.32 Repairs

We are continuing to work on deposition of high yield gold deposits for repair of clear defects on 0.25 um X-ray masks. Not only must the films be deposited with a high yield to avoid or significantly reduce redeposition on nearby features, they must also be symmetrical.

Consequently, we are investigating feed systems to deliver the gas as symmetrically as possible to the surface.

The 0.5 um system is scheduled to be used by members of the X-ray mask community in May and June.

3.33 System Stability

The drift of the Micrion X-ray column was tested on the 0.5 um system. Overall system drift achieved was better than 0.1 um in 10 minutes. This is better than comparable testing for the existing commercial two-lens column currently on the system. However, the system drift should probably be improved for repair of 0.25 um masks.

We plan to investigate the resolution of the laser interferometer system next month.

3.34 Software

Micrion and KLA agreed to test the defect data transfer from the KLA inspection system to the Micrion repair system using the ENH I formatted with an improvement on KLA's end, matched by Micrion implementing a

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Page 2

M. Peckerar/D. Stewart

June 10, 1992

Coordinate Lock routine. Overall, these changes will improve the resolution, or the ability to locate a defect in a field of view. We will test this interface using a Blackbird test pattern supplied by IBM, followed by a "real" mask with actual defects.

3.35 Electronics

Progress of advanced high speed electronics continues. The design of the deflection amplifiers was reviewed in April, and some preliminary design testing has begun in the electronics lab.

OTHER

The 0.25 um mask repair system is hardware complete. Various software programs (mostly Vaccon) have been written and are being tested. The X-ray column has been on the system, and a beam was obtained under a base vacuum of 10^{-7} torr.

The next government review is scheduled for July 9, 1992.

Sincerely,

Diane K. Stewart

X-ray Program Manager

cc: Lt. Herb Byrns, Naval Air Systems Command
Robert Reams, Harry Diamond Laboratory

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