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X-Y-THETA-Z STAGE FOR MASKED ION BEAM LITHOGRAPHY(U)  
NAVAL OCEAN SYSTEMS CENTER SAN DIEGO CA  
J M REEDS ET AL. MAY 87

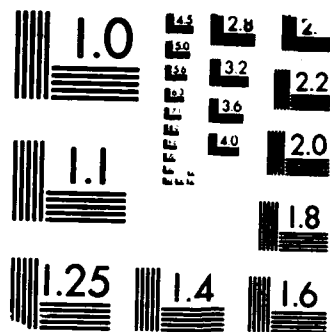
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MICROCOPY RESOLUTION TEST CHART  
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# X-Y- $\theta$ -Z STAGE FOR MASKED ION BEAM LITHOGRAPHY

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## ABSTRACT



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A mechanical stage and electronic drive servos have been built which provide six degrees of freedom of motion in positioning. The stage is used in conjunction with a mask-wafer alignment sensing system to align a semiconductor wafer with a mask to 0.1 micrometer tolerances in a masked ion beam exposure system. Because the exposure system utilizes a step and repeat mode of operation, the stage system was designed to operate at high speed to achieve high wafer throughput. A backlash free capstan drive system is used on the X, Y, and  $\theta$  servos to achieve the high precision, high speed performance.

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