

ENGINEERING RESEARCH INSTITUTE
UNIVERSITY OF MICHIGAN
ANN ARBOR

QUARTERLY REPORT NO. 1

(Covering Period November 1, 1953 -- January 31, 1954)

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Project 2200

DETROIT ORDNANCE DISTRICT, ORDNANCE CORPS, U. S. ARMY
CONTRACT DA-20-018-ORD-13281, DA PROJECT NO. 599-01-004
ORD PROJECT NO. TB2-001-(1040), OOR PROJECT NO. 31-124

March, 1954

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INTRODUCTION

Work on this project began on a small scale in November and with somewhat enlarged scope during December and January. Individual reports of the two current project workers follow. Plans are completed for the full-scale work proposed for the summer period. Both John Walter and James Jans expect to complete their dissertations during the spring semester.

PROGRESS REPORT OF JAMES P. JANS

During the past three months the inequivalent indecomposable representations of algebras over an algebraically closed field have been investigated. A sufficient condition on the lattice of two-sided ideals in the radical for there to exist an infinite number of degrees such that the algebra has infinitely many inequivalent representations of each such degree. If the algebra is commutative this condition is also necessary, for if the condition fails in a commutative algebra, the algebra has only a finite number of inequivalent indecomposable representation.

PROGRESS REPORT OF JOHN WALTER

Work for the past three months has centered on two activities. First, the author's thesis on the automorphism of the projective unitary groups is being completed. The automorphism of these groups acting on linear spaces of dimension greater than 6 and over skew fields which are not of characteristic 2 and have more than three elements have been determined.

This extends the work of Dieudonne and Rickart and also provides a more systematic approach to the discussion of the automorphisms of other Classical Groups. It is expected that 4 to 6 weeks longer will be required to prepare the final draft.

Second, papers by Thrall, Nesbitt, and Brauer on representation theory have been read and at the suggestion of Professor Thrall a paper by K. Taketa on metabelian groups which contains information about commutative group algebras over a finite field has been investigated. Future work will be directed toward determining the structure of commutative algebras. Taketa's article will serve as a good starting point, since he determined canonical forms for the indecomposable components of a representation of commutative group algebras over a finite field. An attempt will be made to extend his results and relate these results to intrinsic properties of algebras.

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