Progress Report for October--December 1956

on

Research in Applications of Mathematical Statistics to Problems of the Chemical Corps

(NBS Project 1103-40-5118)
Progress Report for July-September 1955

on

Research in Applications of Mathematical Statistics to Problems of the Chemical Corps

(NBS Project 1103-40-5118)

This report contains a summary of the work done during the quarter. Results of this work are briefly stated. Technical reports written in connection with this project are mentioned but are transmitted separately.

I. Fractional Replication Designs

The catalogue of fractional replicated designs of the \(2^n\) series has been extended to \(n = 13, 14, 15, 16\) factors, and to fractional replicates of \(1/64, 1/128, 1/256\) of a full factorial. These results are being combined with those of NBS Report 3481 for publication in the NBS Applied Mathematics Series. These latest results are contained in NBS Report 4412 "Fractional Factorial Designs for the \(1/2^s \times 2^n\) series for \(n = 12(1)16\) and \(s = 6, 7, 8\)" by R.C. Burton, F.L. Miller, and H.M. Pettigrew dated 17 July 1955.

II. Combining Statistical Tests of Significance

A manuscript on "Exact Tests of Significance for Combining Intra- and Inter-block Information" has been written for submission to a technical journal. The SEAC code for computing
the power of these tests is completed and computation of the
power points is underway.

III. Computation Methods for the Analysis of Variance.

A first draft of a manuscript on "Some Examples of the
Use of High Speed Computers in Statistics" by J.M. Cameron
has been prepared for inclusion in the proceedings of the
"Conference on the design of experiments in Army Research
Development and Testing". It is now in the hands of the NBS
Editorial Committee.

IV. Bio-Assay Tables

A code for computing $U(\alpha, \beta, h)$ has been written for
SEAC and the code checked. A note describing the features of
the code has been written and will be submitted during January.

V. Programming the Calculation of Probabilities Associated
with Observed Values of Common Statistical Tests

The usual formulas for computing $p\{T > T_0\}$, where $T_0$
is an observed value of some statistic such as $t$, $F$, $X^2$, etc.,
are not in the best form for computation. Some work has been
done on seeking an alternate formula for the mechanization of
such computations. A note giving a number of alternate formulas
has been prepared and will be submitted in January.