ON GENERATING THE SIMPLE GROUP $LF(2, 2^N)$ BY TWO OPERATORS OF PERIODS TWO AND THREE*

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The purpose of this paper is to consider the question of the number of abstractly distinct ways in which it is possible for two operators of periods two and three to generate the simple group $LF(2, 2^N)$. The general procedure to be followed in studying such a problem has been outlined by Professor Brahana† and has already been applied to $LF(2, 2^3)$ by the author.‡ Those previous results suggested the present generalization.

Since the $2^{2N} - 1$ substitutions of period two in $LF(2, 2^N)$ are all conjugate,§ it is sufficient in seeking possible generating operators to consider only one of them, say

$$T \equiv \left(\frac{1, 1}{0, 1}\right).$$

In the representation of G on $2^N + 1$ letters, T leaves fixed the single element ∞. The largest subgroup within which T is invariant is $G^{(\infty)}$, composed of all the substitutions

$$T_\mu \equiv \left(\frac{1, \mu}{0, 1}\right), \qquad\qquad \mu \text{ in the } GF[2^N],$$

which keep the single element ∞ unchanged. The group $G^{(\infty)}$ is abelian, of order 2^N and of type $(1, 1, 1, \cdots)$.

If the operators of period three are divided up into sets of complete conjugates under $G^{(\infty)}$, then the various members of each set satisfy with T the same abstract relations, and it is sufficient to select from each such set only one operator to serve as a possible second generator with T. The number of these sets to be considered depends

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