LETTERS TO THE EDITOR

To The Editor

In a recent paper [*AIChE J.*, 22 (2), 298-317 (1976)] Jayaraman and Lapidus employed the terminology *canonical realization* as equivalent to *minimal realization*. The object of this letter is to show that these two terms have connoted distinct meanings in the current technical literature since Kalman (1963) established the motivation for minimal realization.

It has to be emphasized that the algorithm of Ho-Kalman (1965) univocally leads to minimal but not canonical realization. In fact, canonical forms have well-defined structures, as shown in the papers of Luenberger (1967) and Power (1969): among them, the phase-variable canonical form (Silverman 1966) and the block-companion canonical form (Bucy 1968) have been acclaimed as the simplest, as they have practical advantages in analog or digital simulation. The algorithm of Ackerman and Bucy (1971) cited by the authors is indeed the first solution given to the minimal-realization problem in the canonical form of Bucy. Later other algorithms by Mital and Chen (1973), Bonivento et al. (1973), and Lal et al. (1975) followed.

It is also interesting to observe that the topic of canonical realization for linear, multivariable systems has received, in recent years, the attention of several researchers—Anderson and Luenberger (1967), Wolovich and Falb (1969), Ramar and Ramaswami (1971), Rózsa and Sinha (1975). In this context further information may be had in the paper of Denham (1974) where the concept of canonical forms has been surveyed.

It may be pertinent to add that another elegant method of realization using a combination of moments and Markov parameters to obtain a better long-time approximation is available; details may be found in Shamash (1974). In conclusion, it is hoped that these comments add to the value of the excellent paper of Jayaraman and Lapidus.

The writer would like to record his indebtedness to Dr. Harpreet Singh, Professor, University of Roorkee, Roorkee, India, for introducing him to the fascinating field of system realization.

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