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Laurene V Fausett* (Laurene_Fausett@TAMU-Commerce.edu), Texas A&M
University-Commerce, Department of Mathematics, Commerce, TX 75429-3011. *Characteristics of
Certain Block Matrices with Nilpotent Components.*

Matrices with special block structure are important in a number of settings. In this talk, we consider a problem which arises in digital signal filtering. In order to optimize a cost function, it is necessary to be able to construct a matrix P such that the block matrix of the form $T = [P, JNJP, JN^2JP]$ is invertible, for a given nilpotent matrix N (in Jordan form); J is the counter-identity matrix. An algorithm is presented for construction of a sparse, binary matrix P ; more general forms of P can also be formed in a similar manner. Several related problems are also considered. (Received August 21, 2009)