Electronic Journal of Linear Algebra ISSN 1081-3810
A publication of the International Linear Algebra Society
Volume 13, pp. 249-261, November 2005

ELA
www.math.technion.ac.il/iic/ela

SPECIAL FORMS OF GENERALIZED INVERSES OF ROW BLOCK MATRICES*

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Abstract.
Given a row block matrix $[\,A,\,B\,]$, this paper investigates the relations between the generalized inverse $[\,A,\,B\,]^-$ and the column block matrix $\begin{bmatrix} A^- \\ B^- \end{bmatrix}$ consisting of two generalized inverses A^- and B^-. The first step of the investigation is to establish a formula for the minimal rank of the difference $[\,A,\,B\,]^- - \begin{bmatrix} A^- \\ B^- \end{bmatrix}$, the second step is to find a necessary and sufficient condition for $[\,A,\,B\,]^- = \begin{bmatrix} A^- \\ B^- \end{bmatrix}$ to hold by letting the minimal rank be zero. Seven types of generalized inverses of matrices are taken into account.

Key words. Block matrix, Generalized inverse, Minimal rank formula, Moore-Penrose inverse, Schur complement.

AMS subject classifications. 15A03, 15A09.

* Received by the editors 3 August 2005. Accepted for publication 30 October 2005. Handling Editor: Ravindra B. Bapat.

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