MINIMAL PENCIL REALIZATIONS
OF RATIONAL MATRIX FUNCTIONS WITH SYMMETRIES

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ABSTRACT. A theory of minimal realizations of rational matrix functions $W(\lambda)$ in
the "pencil" form $W(\lambda) = C(\lambda A_1 - A_2)^{-1}B$ is developed. In particular, properties of
the pencil $\lambda A_1 - A_2$ are discussed when $W(\lambda)$ is hermitian on the real line, and when
$W(\lambda)$ is hermitian on the unit circle.