$$Z_{k\ell}[a] := \begin{pmatrix} a_1 & a_2 & & \dots & & a_{\ell-1} & -a_1 - a_2 - \dots - a_{\ell-1}\dots \\ \dots & \dots & & \dots & & \dots a_1 & a_2 \\ \dots & a_{\ell-1} & -a_1 - a_2 - \dots - a_{\ell-1} & & & & \end{pmatrix}, 18mu \text{if } \ell \geq 2,$$