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Exemplo 1: TRL Thru

Cabo 1
"Caixa de erro"

Dispositivo sobre
teste.

Cabo 2
"Caixa de erro"
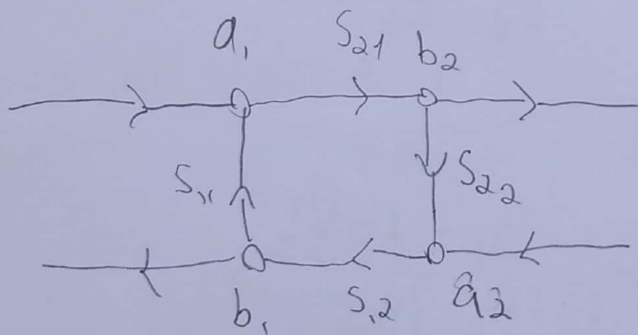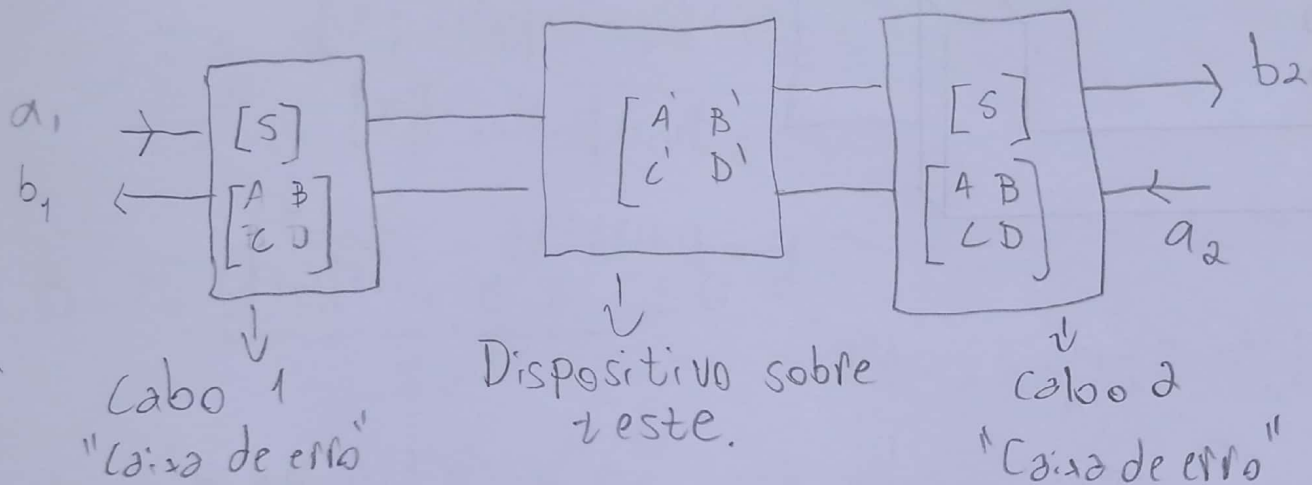
$$S = \begin{bmatrix} S_{11} & S_{12} \\ S_{21} & S_{22} \end{bmatrix}$$

$S_{11} = S_{22} = 1$

$S_{12} = S_{21} = 0$

$$S = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$$

$A = \dfrac{(1+0)(1-0) + 1}{2} = 1$

$B = Z_0 \dfrac{(1+0)(1+0) - 1}{2} = 0$

$C = \dfrac{1}{Z_0} \dfrac{(1-0)(1-0) - 1}{2} = 0$

$D = \dfrac{(1-0)(1+0) + 1}{2} = 1$

$$M_{ABCD} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

M_{ABCD} = identidade $\Rightarrow$ Thru não interfere!

Exemplo 3: TRL Line

$$S_{21} = e^{-\gamma l} \qquad S_{12} = e^{\gamma l} \qquad S_{11} = S_{22} = 0$$

$$S = \begin{bmatrix} 0 & e^{\gamma l} \\ e^{-\gamma l} & 0 \end{bmatrix} \qquad A = \frac{(1+0)(1-0) + e^{\gamma l} e^{-\gamma l}}{2 e^{-\gamma l}} = \frac{2}{2 e^{-\gamma l}} = e^{\gamma l}$$

$$B = Z_0 \frac{(1+0)(1+0) - e^{\gamma l} e^{-\gamma l}}{2 e^{-\gamma l}} = 0$$

$$C = \frac{1}{Z_0} \frac{(1-0)(1-0) - e^{\gamma l} e^{-\gamma l}}{2 e^{-\gamma l}} = 0$$

$$D = \frac{(1-0)(1+0) + e^{\gamma l} e^{-\gamma l}}{2 e^{-\gamma l}} = \frac{2}{2 e^{\gamma l}} = e^{\gamma l}$$

$$M_{ABCD} = \begin{bmatrix} e^{\gamma l} & 0 \\ 0 & e^{\gamma l} \end{bmatrix} = e^{\gamma l} \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

O sinal é apenas γl multiplicado pela foto $e^{\gamma l}$