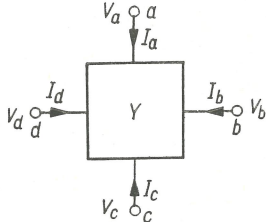
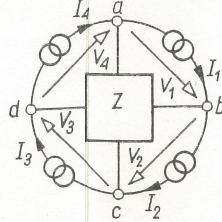
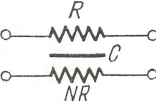
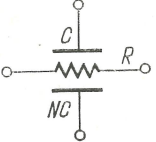


Matrix Formulation of Distributed Parameter Network

Network Configuration $\theta = \sqrt{j\omega(1+N)RC}$	Terminals 	Ports 
$R-C-NR$ 	$\frac{1}{(1+N)R} \left\ \begin{array}{cccc} \frac{\theta}{\tanh \theta} + N & 1 - \frac{\theta}{\tanh \theta} & \frac{\theta}{\sinh \theta} - 1 & -\frac{\theta}{\sinh \theta} - N \\ 1 - \frac{\theta}{\tanh \theta} & \frac{\theta}{\tanh \theta} + \frac{\theta}{N} & -\frac{\theta}{\sinh \theta} - \frac{\theta}{N} & \frac{\theta}{\sinh \theta} - 1 \\ \frac{\theta}{\sinh \theta} - 1 & -\frac{\theta}{\sinh \theta} - \frac{1}{N} & \frac{\theta}{\tanh \theta} + \frac{\theta}{N} & 1 - \frac{\theta}{\tanh \theta} \\ -\frac{\theta}{\sinh \theta} - N & \frac{\theta}{\sinh \theta} - 1 & 1 - \frac{\theta}{\tanh \theta} & \frac{\theta}{\tanh \theta} + N \end{array} \right\ $	$\frac{R}{\theta} \left\ \begin{array}{cccc} \frac{N+1}{\tanh \theta} & -N \tanh \frac{\theta}{2} & -\frac{N+1}{\sinh \theta} & -\tanh \frac{\theta}{2} \\ -N \tanh \frac{\theta}{2} & \frac{N}{N+1} \left(\theta + 2N \tanh \frac{\theta}{2} \right) & -N \tanh \frac{\theta}{2} & -\frac{N}{N+1} \left(\theta - 2 \tanh \frac{\theta}{2} \right) \\ -\frac{N+1}{\sinh \theta} & -N \tanh \frac{\theta}{2} & \frac{N+1}{\tanh \theta} & -\tanh \frac{\theta}{2} \\ -\tanh \frac{\theta}{2} & -\frac{N}{N+1} \left(\theta - 2 \tanh \frac{\theta}{2} \right) & -\tanh \frac{\theta}{2} & \frac{1}{N+1} \left(N\theta + 2 \tanh \frac{\theta}{2} \right) \end{array} \right\ $
$C-R-NC$ 	$\frac{j\omega C}{\theta} \left\ \begin{array}{cccc} \frac{N+1}{\tanh \theta} & -N \tanh \frac{\theta}{2} & -\frac{N+1}{\sinh \theta} & -\tanh \frac{\theta}{2} \\ -N \tanh \frac{\theta}{2} & \frac{N}{N+1} \left(\theta + 2N \tanh \frac{\theta}{2} \right) & -N \tanh \frac{\theta}{2} & -\frac{N}{N+1} \left(\theta - 2 \tanh \frac{\theta}{2} \right) \\ -\frac{N+1}{\sinh \theta} & -N \tanh \frac{\theta}{2} & \frac{N+1}{\tanh \theta} & -\tanh \frac{\theta}{2} \\ -\tanh \frac{\theta}{2} & -\frac{N}{N+1} \left(\theta - 2 \tanh \frac{\theta}{2} \right) & -\tanh \frac{\theta}{2} & \frac{1}{N+1} \left(N\theta + 2 \tanh \frac{\theta}{2} \right) \end{array} \right\ $	$\frac{1}{j\omega(1+N)C} \left\ \begin{array}{cccc} \frac{\theta}{\tanh \theta} + N & 1 - \frac{\theta}{\tanh \theta} & \frac{\theta}{\sinh \theta} - 1 & -\frac{\theta}{\sinh \theta} - N \\ 1 - \frac{\theta}{\tanh \theta} & \frac{\theta}{\tanh \theta} + \frac{1}{N} & -\frac{\theta}{\sinh \theta} - \frac{1}{N} & \frac{\theta}{\sinh \theta} - 1 \\ \frac{\theta}{\sinh \theta} - 1 & -\frac{\theta}{\sinh \theta} - \frac{1}{N} & \frac{\theta}{\tanh \theta} + \frac{1}{N} & 1 - \frac{\theta}{\tanh \theta} \\ -\frac{\theta}{\sinh \theta} - N & \frac{\theta}{\sinh \theta} - 1 & 1 - \frac{\theta}{\tanh \theta} & \frac{\theta}{\tanh \theta} + N \end{array} \right\ $