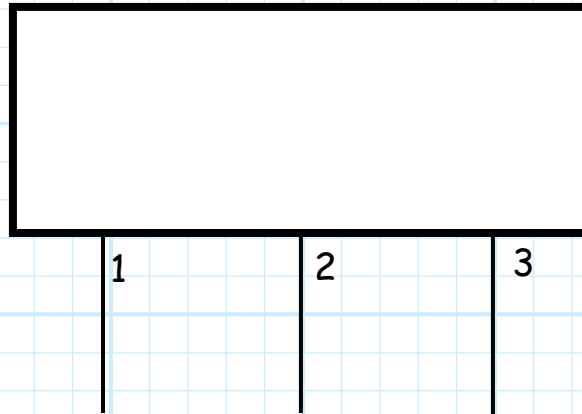


### Special Problem 3.F-2

Consider this microwave **switch**:



This switch can be in **either** state "A" or state "B", where:

in state "A" port 1 and port 2 are connected.

in state "B" port 2 and port 3 are connected.

The **scattering matrix** of this device in one state is:

$$\mathcal{S} = \begin{bmatrix} 0.001 & j0.90 & 0.001 \\ j0.90 & 0.001 & 0.001 \\ 0.001 & 0.001 & 0.001 \end{bmatrix}$$

From this **scattering matrix**, determine (**justify** your answers!):

1. The **state** of this switch ("A" or "B").
2. If the switch is **absorptive** or **reflective**.
3. The **insertion loss** of the device.