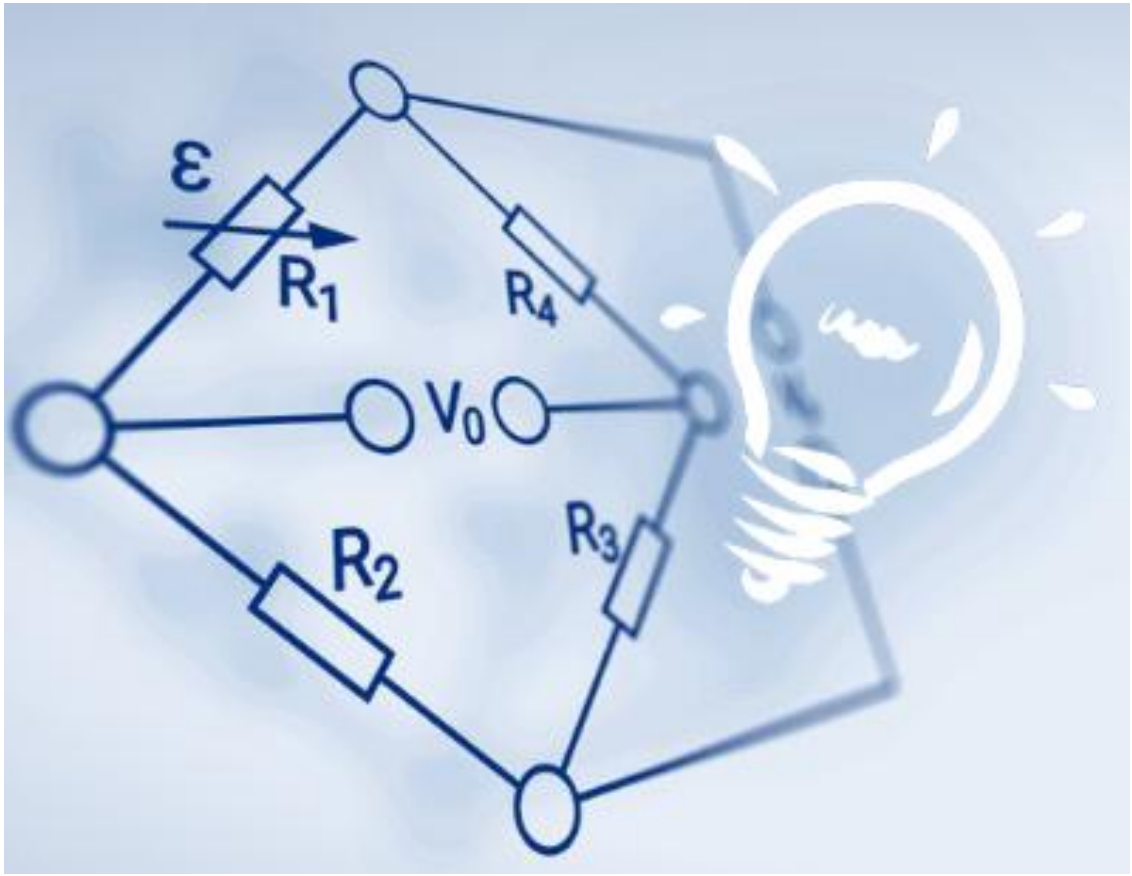
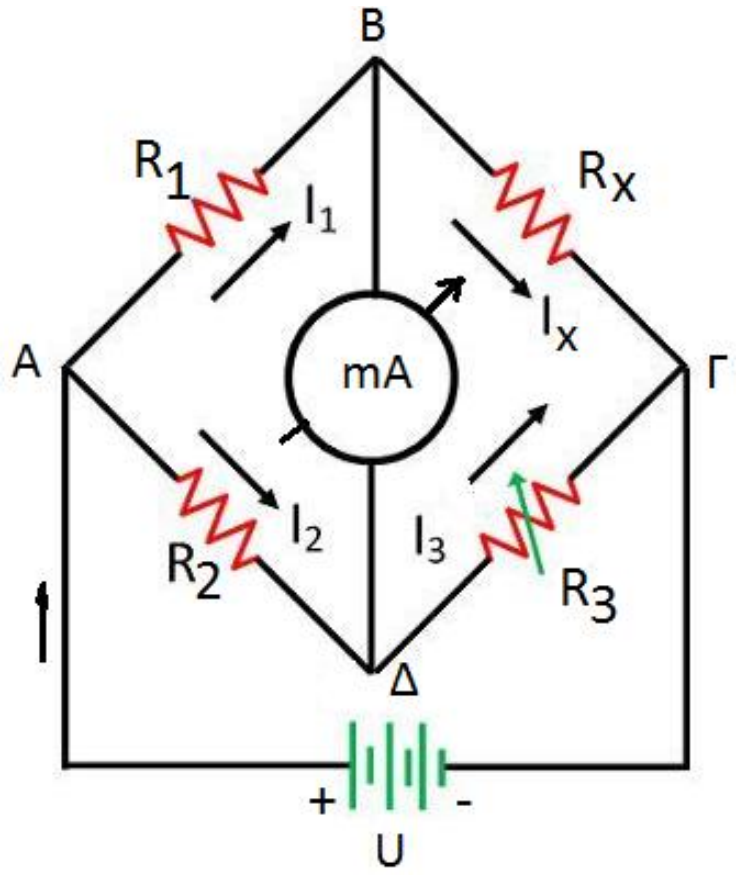
Γέφυρα Wheatstone



http://imarinakis.mysch.gr/

Γέφυρα Wheatstone



Στην κατάσταση της ισορροπίας:

$$\left.\begin{matrix} U_{AB} = U_{A\Delta} \\ U_{B\Gamma} = U_{\Gamma\Delta} \end{matrix}\right\} \Leftrightarrow \left.\begin{matrix} R_1 I_1 = R_2 I_2 \\ R_x I_x = R_3 I_3 \end{matrix}\right\}$$

Γέφυρα Wheatstone

Επειδή:

$$I_2 = I_3$$

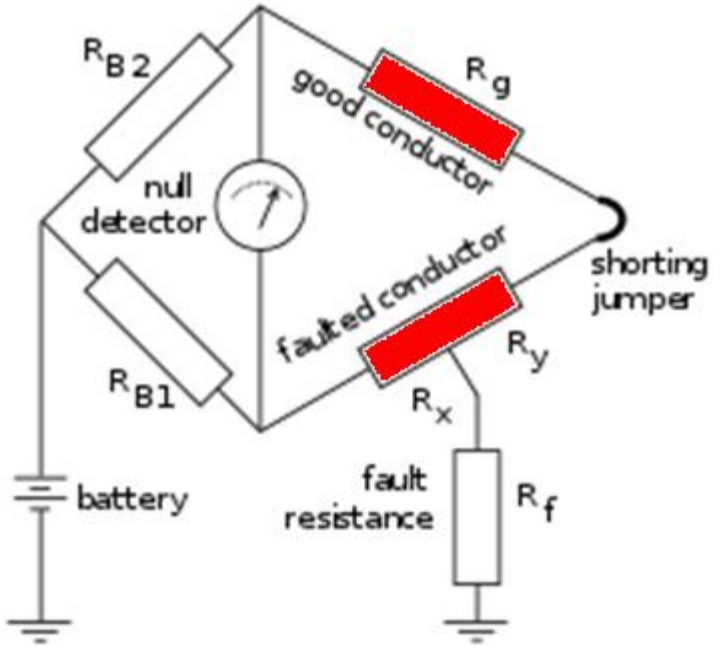
$$I_1 = I_x$$

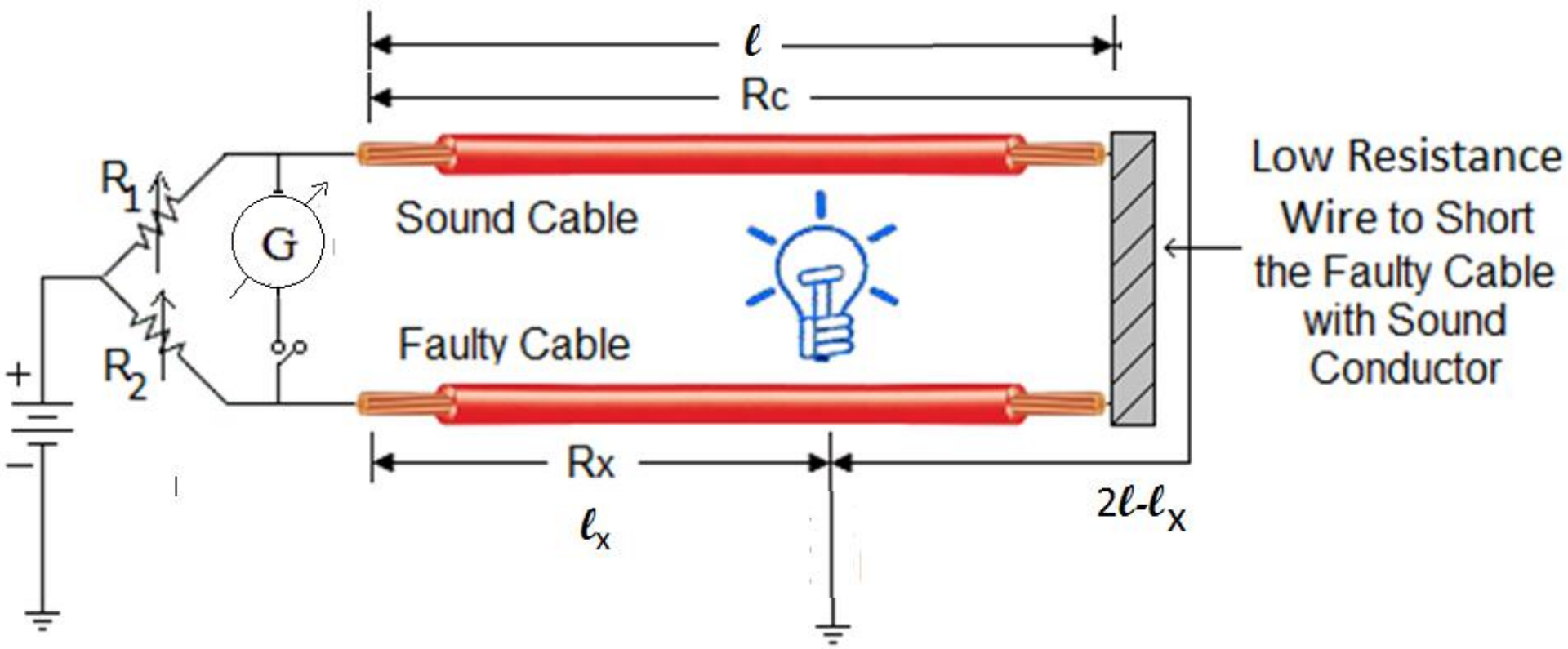
$$\frac{R_1 I_1}{R_x I_x} = \frac{R_2 I_2}{R_3 I_3} \Leftrightarrow \frac{R_1}{R_x} = \frac{R_2}{R_3} \Rightarrow$$

$$R_1 R_3 = R_2 R_x$$

$$R_x = \frac{R_1}{R_2} R_3$$

Γέφυρα Murray





Murray Loop Test For Ground Fault

www.electricaltechnology.org

$$\left.\begin{aligned} R_1 R_x &= R_2 R_c \\ R_x &= \rho_{Cu}\frac{\ell_x}{S} \\ R_c &= \rho_{Cu}\frac{2\ell - \ell_x}{S} \end{aligned}\right\} \Rightarrow$$

$$R_1\left(\rho_{Cu}\frac{\ell_x}{S}\right) = R_2\left(\rho_{Cu}\frac{2\ell - \ell_x}{S}\right) \Leftrightarrow$$

$$R_1\ell_x = R_2(2\ell - \ell_x) \Leftrightarrow$$

$$R_1\ell_x = 2R_2\ell - R_2\ell_x \Leftrightarrow$$

$$R_1\ell_x + R_2\ell_x = 2R_2\ell \Leftrightarrow$$

$$(R_1 + R_2)\ell_x = 2R_2\ell \Rightarrow$$

$$\boxed{\ell_x = \frac{2R_2\ell}{R_1 + R_2}}$$

Γέφυρα Murray