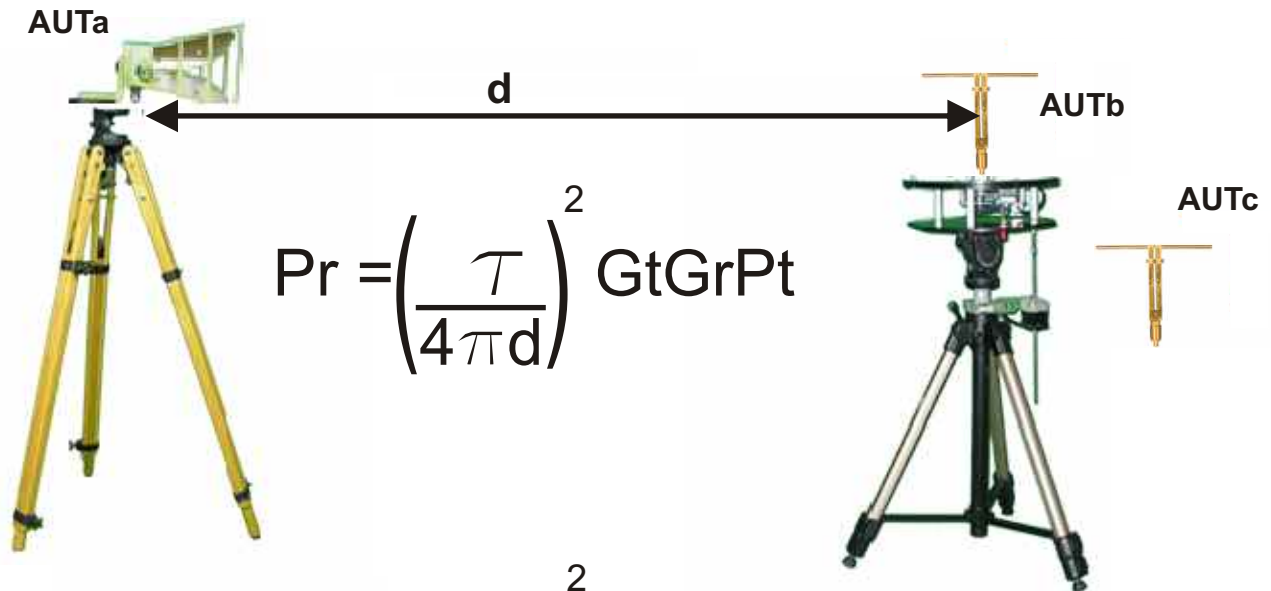


Antenna Gain Measurement Using The 3 - Point method - Does not require a calibrated reference antenna



$$P_r = \left(\frac{\tau}{4\pi d} \right)^2 G_t G_r P_t$$

$$P_L = 10 \text{Log} \left(\frac{\tau}{4\pi d} \right)^2 = \text{Path loss (dB)}$$

Note that $P_r/P_t = S_{21}^2$

Use the db version of Friss formula:

$$S_{21\text{db}} = P_L + G_t + G_r$$

Set up the following system of 3 equations with 3 unknowns

Note: Peak the initial setup for max signal by using "move to max"

$S_{21}^{ab} = P_L + G_a + G_b$	Measurement with A and B antennas
$S_{21}^{ac} = P_L + G_a + G_c$	Measurement with A and C antennas
$S_{21}^{bc} = P_L + G_b + G_c$	Measurement with B and C antennas

Solve for each Antenna gain by interchanging the Superscripts:

$$G_a = (S_{21}^{ab} + S_{21}^{ac} - S_{21}^{bc} - P_L) / 2$$