Setup:

Assume 3 polypoint tags (A, B, C), all 1 m from each other.

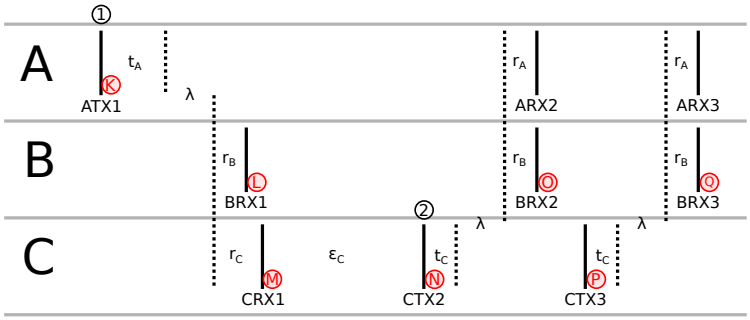
- t_A = tx delay for tag A (unknown)
- r_A = rx delay for tag A (unknown)
- λ = time of flight for 1 m ($\lambda = \frac{1}{c} \times$ `DWT_TIME_UNITS`)
- ϵ = precise delay before sending the next packet (i.e. 5 ms)

The goal is to determine the calibration factor for a tag, $cal_A = t_A + r_A$.

Protocol:

The following sequence will recover the cal_C. Note that timestamps from local clocks are not synchronized, nor can the clocks be assumed to be running at exactly the same speed.

1. Tag A sends a packet
2. Tag C sends a packet after ϵ
3. Tag C sends a packet after ϵ



$$BRX1 = ATX1 + t_A + \lambda + r_B \tag{1}$$

$$BRX2 = ATX1 + t_A + \lambda + r_C + \epsilon_C + t_C + \lambda + r_B \tag{2}$$

$$BRX2 - BRX1 = \Delta_B = r_C + t_C + \epsilon_C + \lambda \tag{3}$$

$$k_{C \to B} = \frac{BRX3 - BRX2}{CTX3 - CTX2} \tag{4}$$

$$r_C + t_C = \Delta_B - \epsilon_C \times k_{C \to B} - \lambda \tag{5}$$