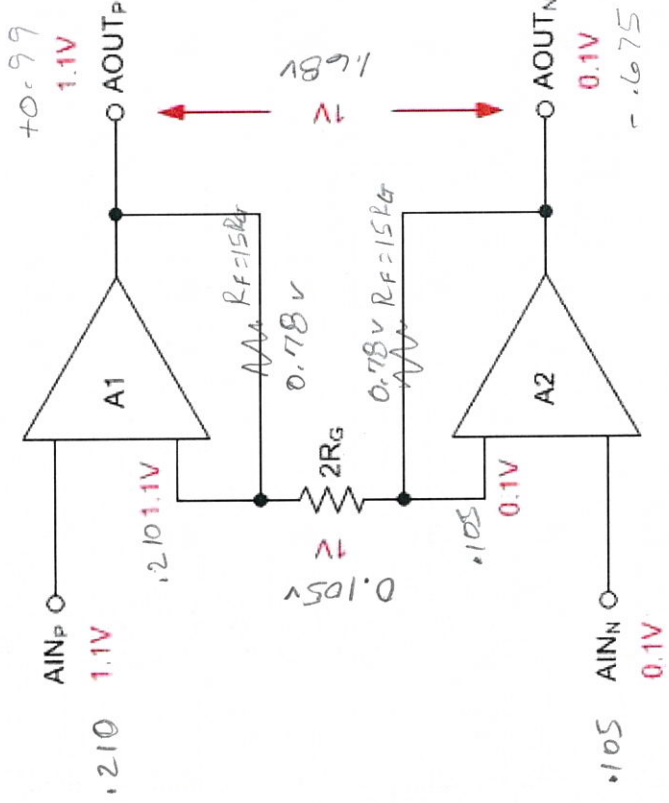


Understanding how the PGA works

Common-Mode Voltage Requirement



$$\text{Gain} = 1V/V \quad 16 \frac{V}{V} \Rightarrow \frac{R_F}{R_G} = 15$$

$$V_{CM} = (1.1V + 0.1V) / 2 = 0.6V$$

V_{CM} min. requirement:

$$AVSS + 0.1V + (1V \cdot 1) / 2 = 0.6V$$

- A1 and A2 are no Rail-to-Rail Output amplifiers. They can only drive ~0.1V to the rails in ADS1248.
- Therefore AOUT_P and AOUT_N have to be > (AVSS+0.1V) or < (AVDD-0.1V).
- This is where the confusing common-mode voltage requirement for the inputs is coming from:

$$\left(\begin{matrix} -2.5 \\ -2.14 \end{matrix} \right) \left(\begin{matrix} -2.5 \\ -2.14 \end{matrix} \right) + \frac{(V_{IN})(\text{Gain})}{2} \leq V_{CM} \leq \left(\begin{matrix} 2.5 \\ 2.14 \end{matrix} \right) - \frac{(V_{IN})(\text{Gain})}{2}$$