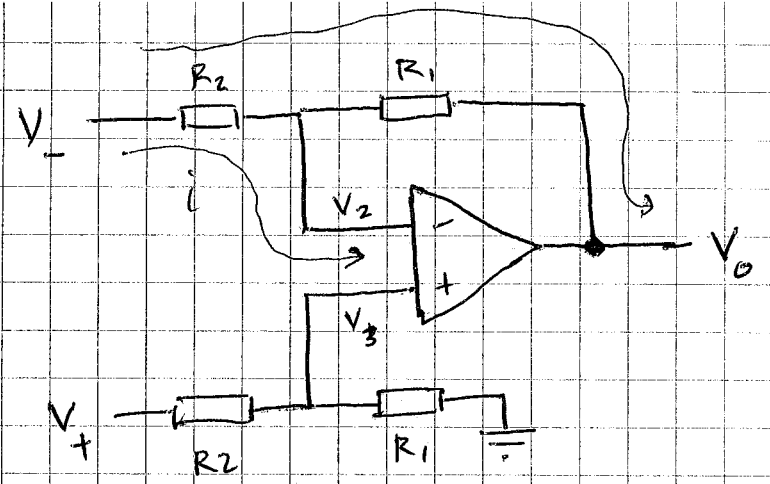
DIFFERENTIAL TO SINGLE ENDED AMPLIFIER



$$V_3 = \frac{R1}{R1+R2} V_+$$

$$V_- = i R_2 + V_2$$

(OPAMP FORCES $V_2 = V_3$)

$$\left(V_2 = V_3 = \frac{R1}{R1+R2} V_+ \right)$$

$$V_- = i R_2 + \frac{R_1}{R_1+R_2} V_+$$

$$\left(V_- = i R_2 + i R_1 + V_0 \right)$$

$$\left(\frac{V_- - V_0}{(R_2+R_1)} = i \right)$$

$$V_- = (V_- - V_0)\frac{R_2}{(R_1+R_2)} + \frac{R_1}{(R_1+R_2)} V_+$$

$$(R_1+R_2) V_- = V_- R_2 + V_0 R_2 + R_1 V_+$$

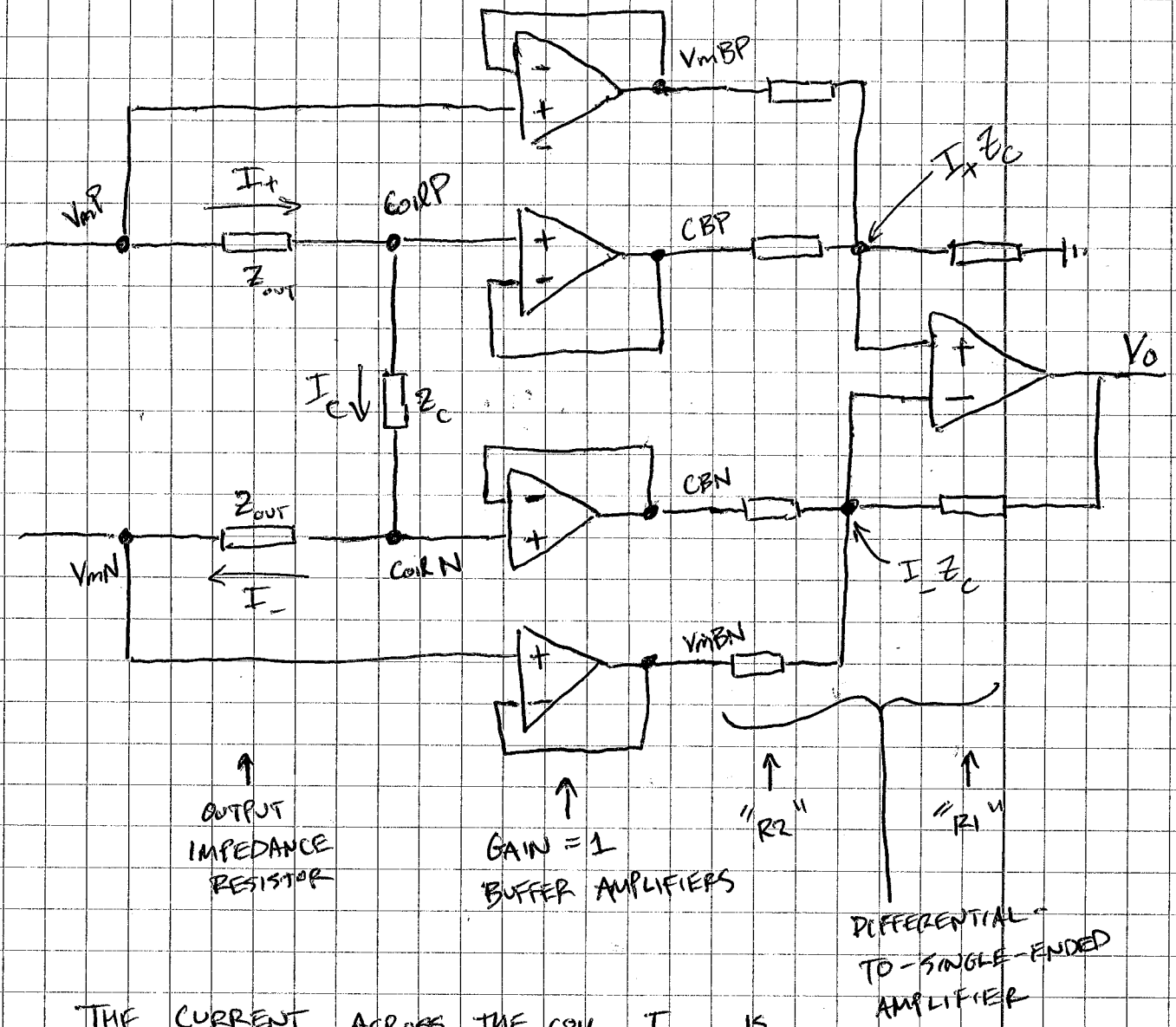
$$(R_1+R_2) V_- - R_2 V_- = V_0 R_2 + R_1 V_+$$

$$V_- R_1 - V_+ R_1 = -V_0 R_2$$

$$(V_- - V_+) R_1 = -V_0 R_2$$

$$(V_+ - V_-) R_1 = V_0 R_2 \Longrightarrow \frac{V_0}{(V_+ - V_-)} = \frac{R_1}{R_2}$$

COIL DRIVER CURRENT MONITOR



THE CURRENT ACROSS THE COIL, I_C IS EQUIVALENT IN MAGNITUDE TO THE VOLTAGE ACROSS THE OUTPUT IMPEDANCE,

$$(V_{mP} - Coil_P) = I_+ Z_{out} = I_C Z_C$$

$$(V_{mN} - Coil_N) = I_- Z_{out} = -I_C Z_C$$

AND FROM THE PREVIOUS PAGE,

$$\frac{V_o}{(I_+ Z_{out} - I_- Z_{out})} = \frac{R_1}{R_2}$$

$$\frac{V_o}{Z_{out}(I_C - (-I_C))} = \frac{R_1}{R_2} \Longrightarrow \frac{V_o}{I_C} = 2 Z_{out} \frac{R_1}{R_2}$$