

Bandwidth, drive strength, area, power cons

Swing, dc gain \leftarrow topology

EEL 782: Analog Integrated Circuits

"Feedback"

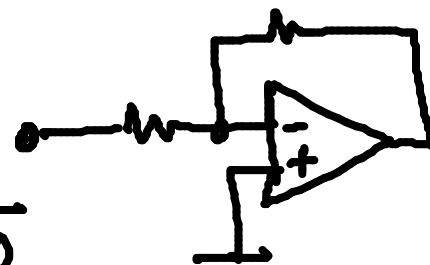
Ideal VCVS

VCCS

CCCS

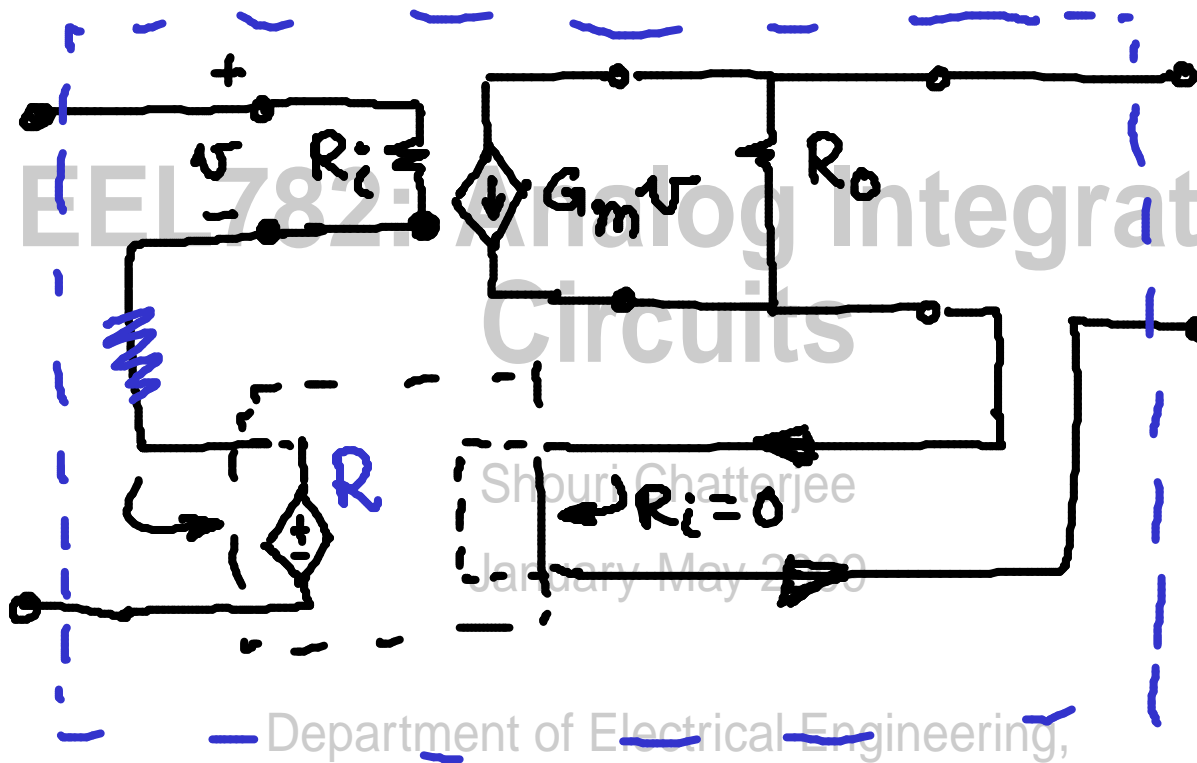
CCVS

	R_i	R_o
\rightarrow	∞	0
	∞	∞
	0	∞
	0	0



In the presence of $-ive$ feedback, controlled sources become better controlled sources.

VCCS



LOOP GAIN = $G_m R$

Overall $R_i = R_i (1 + G_m R)$

Overall $R_o = R_o (1 + G_m R)$

Overall $G_m = \frac{G_m}{1 + G_m R}$

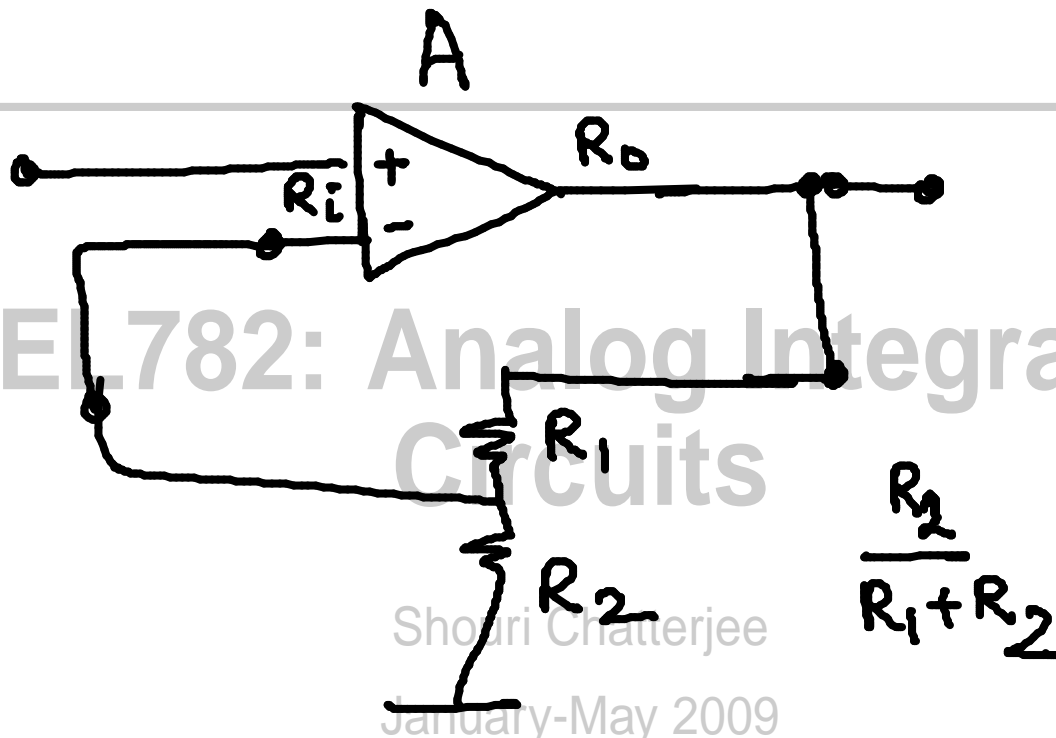
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VCVS

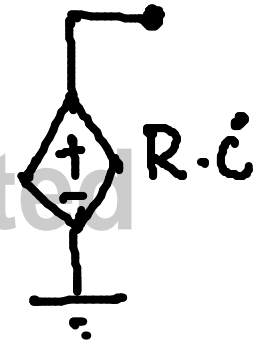
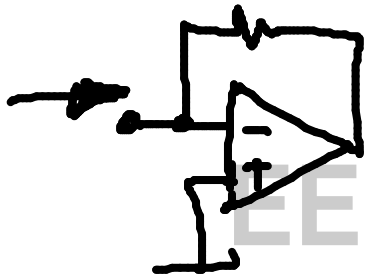


$$\text{New Input Res} = R_i \left(1 + \frac{A R_2}{R_1 + R_2} \right) \checkmark$$

$$\text{New Output Res} = R_o / \left(1 + \frac{A R_2}{R_1 + R_2} \right) \checkmark$$

$$\text{Gain} = \frac{A}{1 + \frac{A R_2}{R_1 + R_2}} \approx \frac{R_1 + R_2}{R_2} = 1 + \frac{R_1}{R_2}$$

CCVS

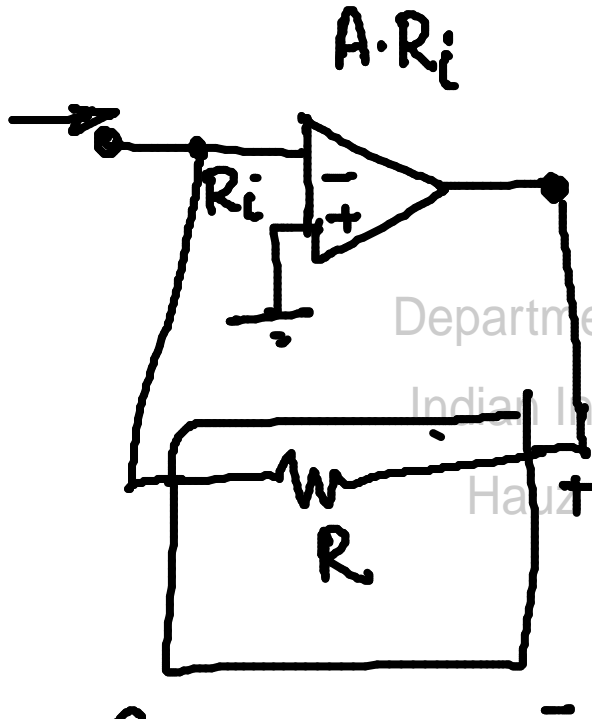


EEL782: Analog Integrated Circuits

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$$L_G = AR_i/R$$

$$\frac{AR_i}{1 + AR_i/R} \approx R$$



$$\frac{R_i}{1 + AR_i/R} \approx R/A$$

$$\frac{R_o}{1 + AR_i/R}$$