KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS
DEPARTMENT OF ELECTRICAL ENGINEERING
Electronic Circuits II – EE303

Experiment # 5
Feedback Amplifiers

OBJECTIVE

To study the properties of negative feedback amplifiers.

PRELAB WORK

Students must perform the following calculations and PSPICE before coming to the lab.

1. For the circuit shown in Figure 1, use the feedback techniques to perform a complete ac small signal analysis and obtain the MF gain, the LF poles, the HF poles, the bandwidth, and the input resistance, the output resistance of this amplifier with and without feedback.

2. Using SPICE simulate your circuit and from SPICE output file calculate the parameters of the amplifier obtained in step 1. For the SPICE analysis use the frequency range 100Hz to 8MHz. Use β=100, C_μ=C_{bc}=8pF and C_π=C_{be}=30pF.

3. Tabulate the results obtained from your hand calculations and from SPICE simulation in Table I.

You must have your SPICE output file with your hand calculations ready before you come to the lab.

EXPERIMENTAL WORK

1. Construct the circuit shown in Figure 1. Apply a small ac signal v_s and make sure by monitoring the oscilloscope that the output voltage is not distorted. Change the input frequency from 100Hz to 3MHz. At each frequency measure the small signal voltage gain and plot it on the same graph supplied by SPICE output file.

2. Calculate the MF range, LF poles, HF poles and bandwidth from your measured gain-frequency characteristic.

3. Measure R_{in} and R_{out} at medium frequency and tabulate the results of steps 1, 2 and 3 in Table I.

4. Now remove the resistor R_F and capacitor C_F and repeat steps 1, 2 and 3.

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5. Compare your hand calculations, SPICE simulations and experimental measurements.
6. Comment on your results.

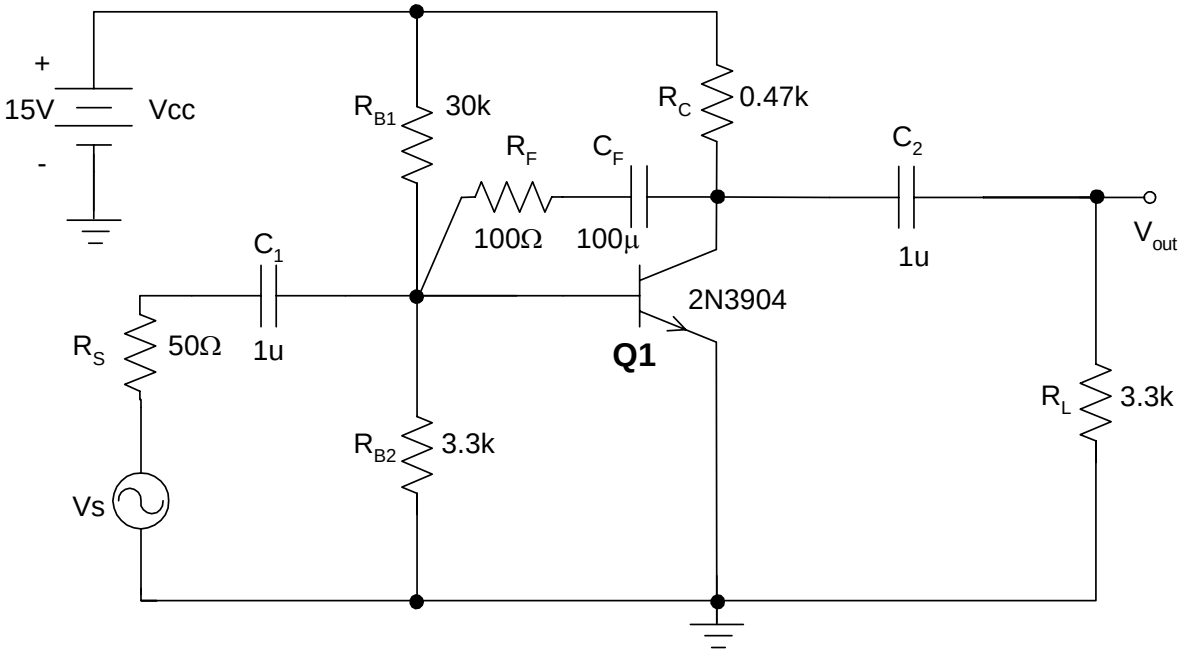

Figure 1

Table I: Summary of hand calculations, SPICE simulation and experiment

	With Feedback			**Without Feedback**		
	Hand Calculation	**SPICE**	**Experiment**	**Hand Calculation**	**SPICE**	**Experiment**
MF Gain						
Bandwidth						
R_{in}						
R_{out}						

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