

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

Experiment # 2
**Gain Frequency Characteristics of Multistage
Transistor Amplifiers**

OBJECTIVE

To study the effects of coupling and junction capacitors on the gain and frequency response of multistage transistor amplifiers.

PRELAB WORK

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

1. For the two stage amplifier circuit shown in Figure 1 perform a complete small signal ac analysis and obtain the MF gain, the LF poles, the HF poles (corner frequencies) and bandwidth of this multistage amplifier. Also find the small signal input and output resistances.
2. Using SPICE simulate your circuit and try to deduce from the SPICE output file, the MF gain, the LF poles, the HF poles and the bandwidth. Also obtain the input resistance and the output resistance using SPICE. For the SPICE analysis use the frequency range 100Hz to 8MHz. Use $\beta=100$, $C_{\mu}=C_{bc}=8\text{pF}$ and $C_{\pi}=C_{be}=30\text{pF}$.
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 output on 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. Insert your experimental results into Table I.

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

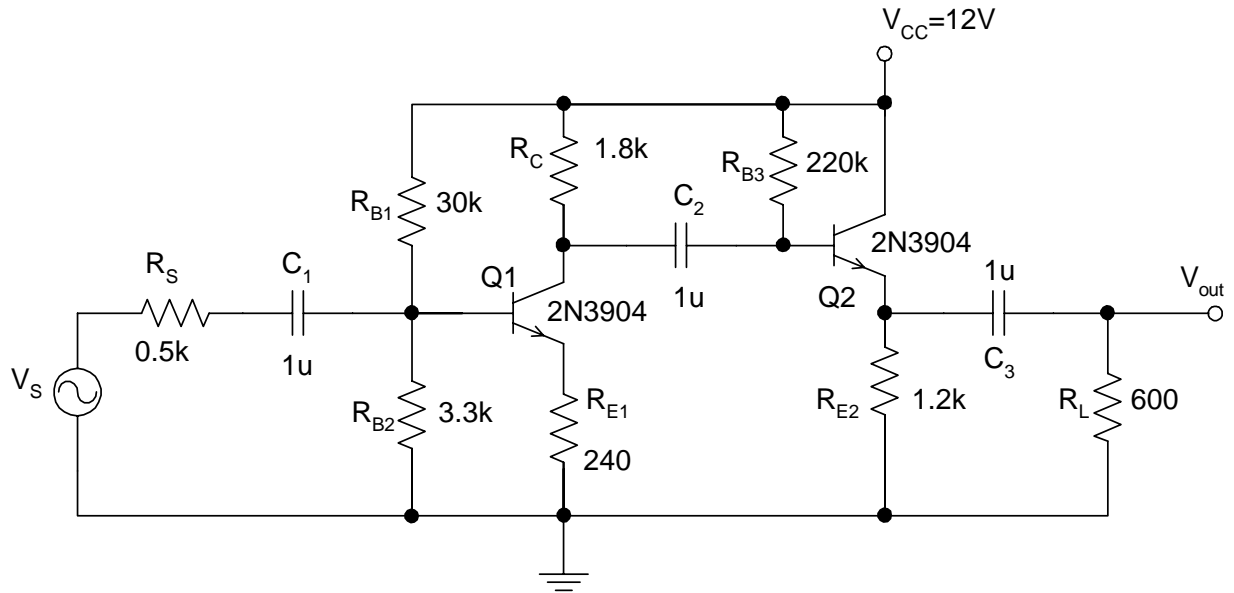


Figure 1

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

Parameter	Hand Calculation	SPICE Simulation	Experimental Result
MF Gain			
LF Poles (Corner Frequencies)			
HF Poles (Corner Frequencies)			
Bandwidth			