Department of Electrical and Computer Engineering
University of Victoria
ELEC 300 - Linear Circuits II

LABORATORY REPORT

Experiment No.: _____

Title: _____

Date of Experiment: _____

(should be as scheduled)

Report Submitted on: _____

(should be within one week from the time of experiment)

To: _____

Laboratory Group #: _____

Names: (please print) _____

_____

_____

_____

Fig. 0-1. The front page of a lab report

1 Objective

To create two variants of independent sources, both a voltage source and a current source, and analyze their behaviour compared to that expected from theory and calculations.

2 Introduction

Two dependent sources were created and analyzed in this lab. A voltage-controlled voltage source (VCVS) and a voltage-controlled current source (VCCS) were the examples of both voltages sources and current sources in this lab. A schematic of both circuits built is available in the lab manual. [1, p. 18]

3 Results

3.1 Voltage controlled voltage source (VCVS)

3.2 Voltage controlled current source (VCCS)

4 Discussion

What is expected response? Refer to formulas in lab manual.

Response is capped at expected values on positive side but is lower than expected on negative side. Why?

Effect of load changing Rl = 1k to 150?

Internal resistance calculation (1)

$$V_o = GV_i \frac{R_L}{R_{out} + R_L} \implies R_{out} = R_L \left(\frac{GV_i}{V_o} - 1 \right) \tag{1}$$

$$\begin{aligned} R_{out} &= 47\,\Omega \left(\frac{2 \times 0.7885\,\mathrm{V}}{0.7056\,\mathrm{V}} - 1 \right) \\ &= 58.04\,\Omega \end{aligned}$$

Expected response?

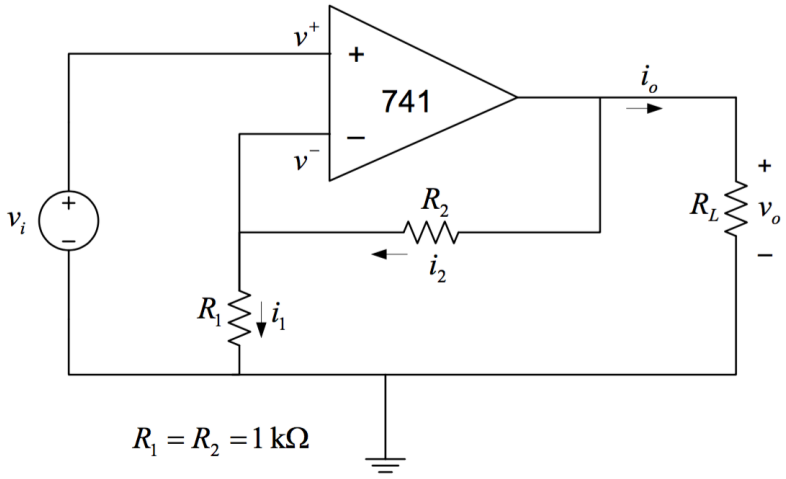


Figure 1: Schematic for VCVS with $G = 2$

V_i (V)	V_o (V)
−6	−8.467
−5	−8.468
−4	−8.007
−3	−6.005
−2	−4.003
−1	−2.001
0	0.001
1	2.036
2	4.007
3	6.010
4	8.011
5	9.060
6	9.060

Table 1: Response of VCVS

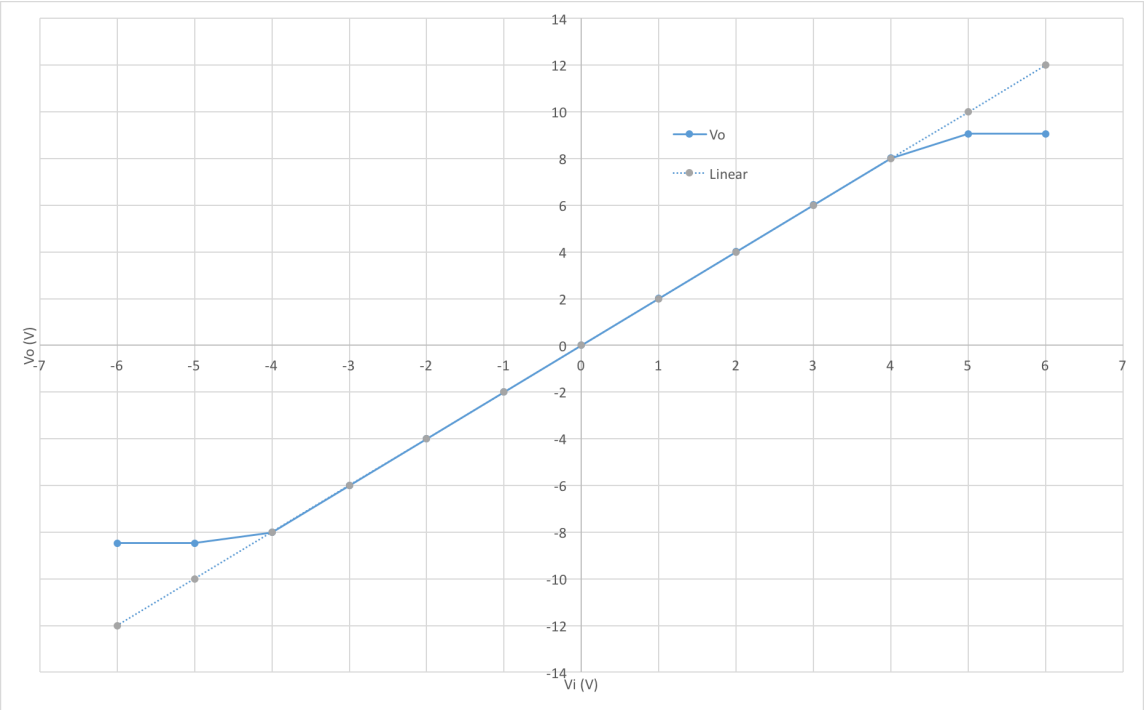
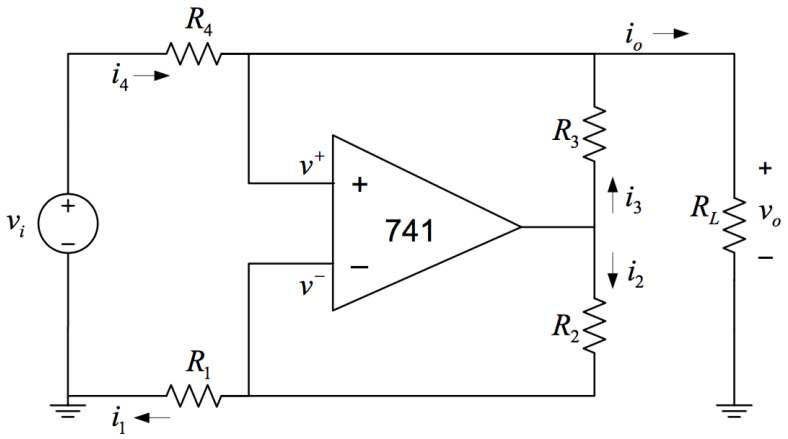


Figure 2: Response characteristic of VCVS with expected linear behavior



$$R_1 = R_2 = R_3 = R_4 = 1\,\text{k}\Omega$$

Figure 3: Schematic for VCCS with $G = 1$

V_i (V)	I_o (mA)
−8	−5.405
−7	−5.076
−6	−4.747
−5	−4.418
−4	−4.056
−3	−3.043
−2	−2.028
−1	−1.014
0	−0.001
1	1.104
2	2.024
3	3.042
4	4.056
5	4.638
6	4.956
7	5.293
8	5.620

Table 2: Response of VCCS

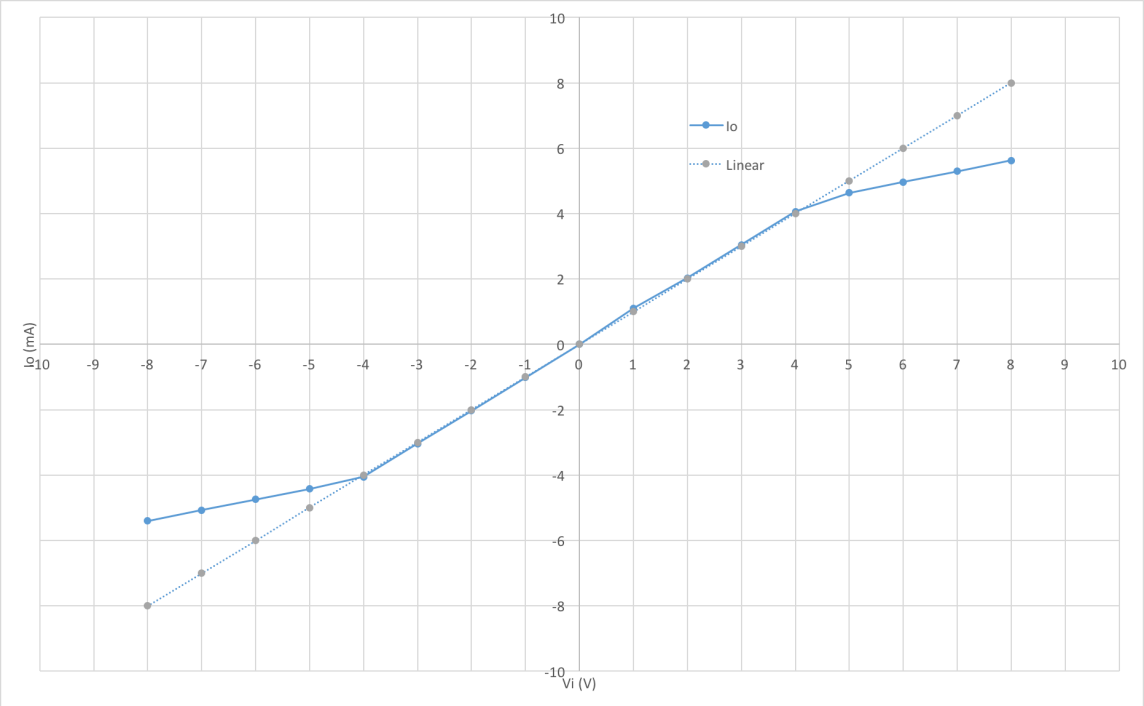


Figure 4: Response characteristic of VCCS with expected linear behavior

Same asymmetric capping as vcvs. Why?

Effect of changing Rl = 1k to 0?

Diff between V+ and V-? Same as expected (0)?

5 Conclusion

Justify conclusions and results.

References

[1] P. So and A. Zielinski, *Laboratory Manual for ELEC 300 - Linear Circuits II*, University of Victoria.