



WORCESTER POLYTECHNIC INSTITUTE

ROBOTICS ENGINEERING PROGRAM - RBE2002

Lab 1 : Electrical Circuits and Operational Amplifiers

Authors:

Dale Herzog

Rob Dabrowski

Steve Kelly

Date: November 7, 2012

Instructor: Prof.

Putnam *Section:* B02 -

2012

Abstract

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Figure 1: This is the caption for the picture.

1 Introduction

The purpose of this experiment is to determine xxx xxxxx xxxxx xxx xxxxx
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way to insert a figure or simply leave some white space for a figure that is to
be pasted in later, like a photo or a hand-drawn sketch. As seen in Figure 1,

everything is clear. xxx xxxxx xxxxx xxx xxxxx xxxxx xxxxx xxxxx xxxxx
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¹Here's the text of the footnote.

2 Method

2.1 RLC Circuits

2.2 Operational Amplifiers

2.3 Load Effect

2.4 Amplification

2.5 Filtering

2.6 Operations with Amplifiers

2.6.1 Using the Multisim simulator

3 Results

3.1 RLC Circuits

3.2 Operational Amplifiers

3.3 Load Effect

3.4 Amplification

3.5 Filtering

3.6 Operations with Amplifiers

3.6.1 Using the Multisim simulator

4 Discussion

4.1 RLC Circuits

4.2 Operational Amplifiers

4.3 Load Effect

4.4 Amplification

4.5 Filtering

4.6 Operations with Amplifiers

4.6.1 Using the Multisim simulator

5 Conclusion

In conclusion, this experiment xxx xxxxx xxxxx xxx xxxx xxxx xxxxx xxxxx

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XXXX XXXXX XXXX XXXXXXXXXXX

References

- [1] D. Adams. *The Hitchhiker's Guide to the Galaxy*. San Val, 1995.

A Raw data

Table 1: Resistance and Temperature of the Filament

$R(T), \Omega$	T, K	$1/T, \text{K}^{-1}$	$\ln P$
151.00±3.92	828.35±23.46	1.2072×10^{-3}	-13.29
157.12±3.71	856.88±22.25	1.1671×10^{-3}	-12.64
162.53±3.49	881.99±21.02	1.1338×10^{-3}	-12.33
166.67±3.33	901.14±20.13	1.1097×10^{-3}	-11.90
171.84±3.17	924.98±19.25	1.0811×10^{-3}	-11.25
176.84±3.04	947.96±18.53	1.0549×10^{-3}	-10.77
181.46±2.90	969.13±15.49	1.0319×10^{-3}	-10.20
186.49±2.79	992.09±17.18	1.0080×10^{-3}	-9.66
190.91±2.69	1012.21±16.65	9.8794×10^{-4}	-9.13
195.48±2.59	1032.95±16.45	9.6811×10^{-4}	-8.60
199.93±2.50	1053.08±15.65	9.4960×10^{-4}	-8.10
204.47±2.41	1073.56±15.19	9.3148×10^{-4}	-7.63
208.62±2.34	1092.22±14.83	9.1556×10^{-4}	-7.16

B A physica macro

This physica macro was used to generate the plot of Figure as well as to fit
xxx xxxxx xxxxx xxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxxxxxxxxx
xxx xxxxx xxxxx xxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxxxxxxxxx

```
! exp_3.pcm
clear

! read in the data
read\format\noerror exp_3.dat (*) x,y,dy

! plot the data
label\x 'Voltage, V'
label\y 'Power, W'
set colour 1 1
set pchar -4
graph x,y,dy

! fit and plot the curve
scalar\vary A,T,w,phi
! initial values for parameters
A=2.3
w=6.5
phi=0
T=10.

fit y=A*cos(w*x+phi)*exp(-x**2/T)
fit\update f
set colour 2 2
set pchar 0
graph\noaxes x,f
```