

**LABORATORY REPORT OF  
TRANSISTOR AMPLIFYING CIRCUIT**

**Prepared for  
BUPT University**

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## **EXPERIMENT EQUIPMENT**

- a. Digital multimeter
- b. DC stabilized voltage power supply.
- c. Function signal generating device
- d. AC millivolt
- e. Double-trace oscilloscope

## **PREPARATION REQUIREMENTS**

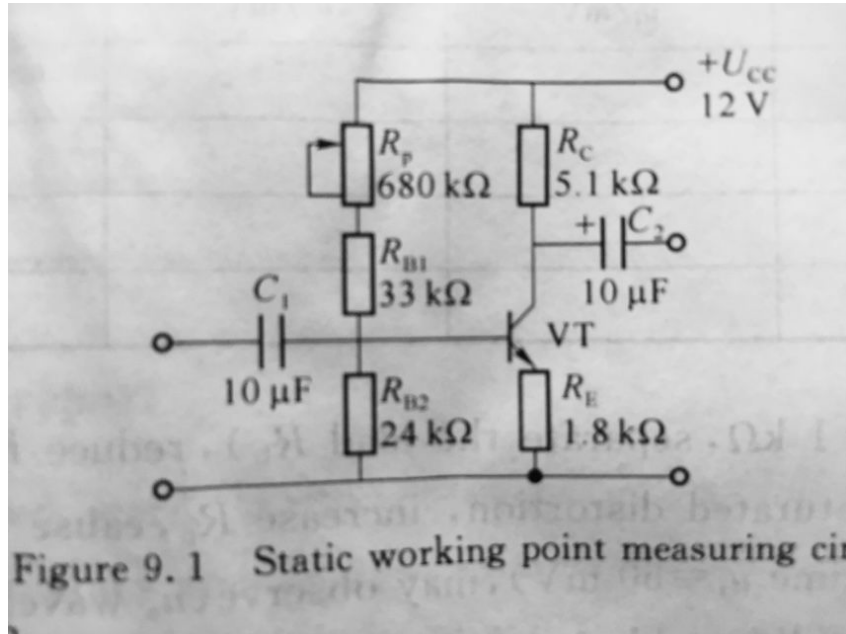
- a. Transistor amplifying circuit's principle of working.
- b. Amplifying circuit static state working point measuring and debugging.
- c. Research amplifying circuit's dynamic working principle.

## **LAB PROCEDURE**

### **Step1**

The measurement of the amplifying circuit static state working point.

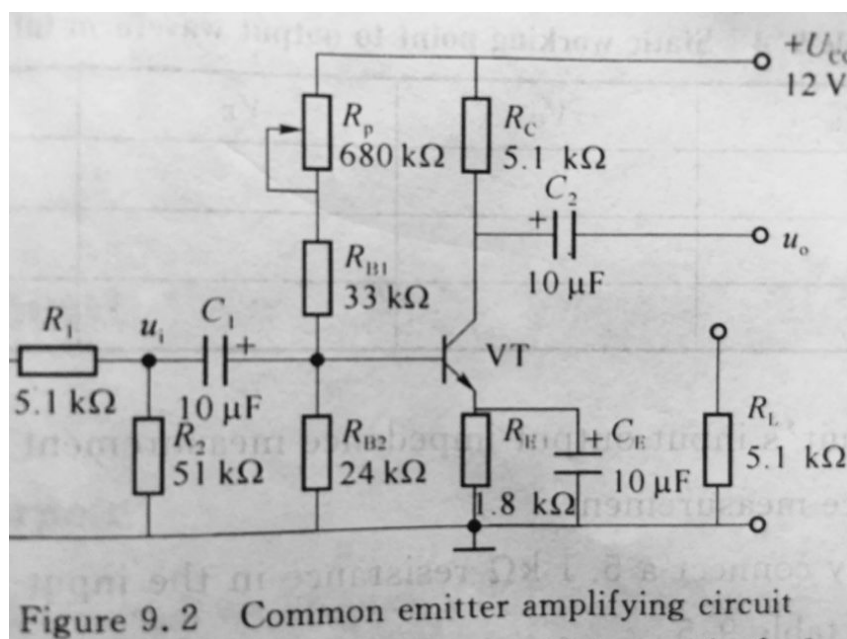
- a. Judge triode's polarity and the quality with the multimeter.
- b. According to Figure 9.1 junction circuit, connect direct-current power supply, measure the voltage and calculate the voltage and current. Then fill them in the table 9.1



## Step2

Dynamic research

- According to figure 9.2 junction circuit, adjusts  $R_p$  to cause  $V_c$  to be equal to 6V.
- Adjust signal generator's output for the sinusoidal signal of  $f = 1\text{kHz}$ ,  $U_s = 500\text{mV}$ , and connect to Figure 9.2 electric circuit's A spot, through  $R_1$   $R_2$  attenuation 100 times, the signal which the  $U_i$  obtain  $5\text{mV}$ , and observe  $U_i$ ,  $U_o$  signal, pay attention to phase



relation, and draw  $U_i$   $U_o$  waveform.

c. Maintain the signal generating device output signal frequency invariable, increase the signal scope gradually, observe the most greatly not distorted voltage  $U_p$  and fill in the table 9.2

### Step3

Amplifying circuit's input-output impedance measurement

- Input resistance measurement.
- Output impedance measurement

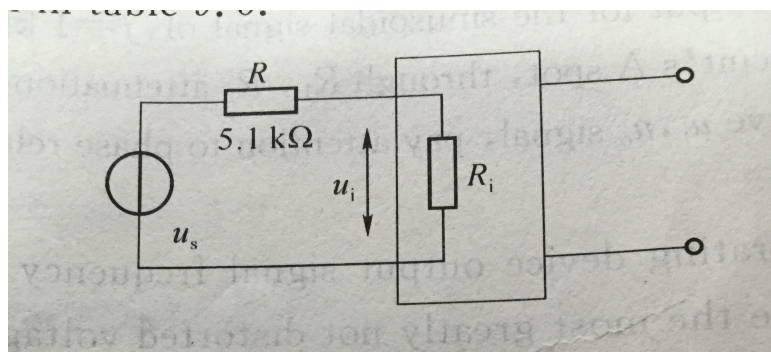


Figure 9.3 Input resistance measurement

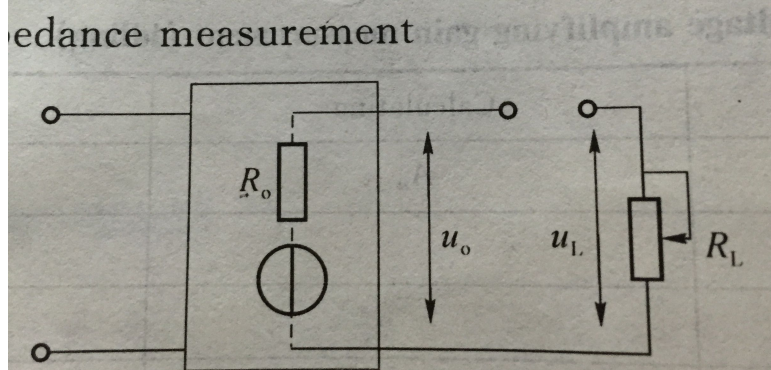


Figure 9.4 Output impedance measurement

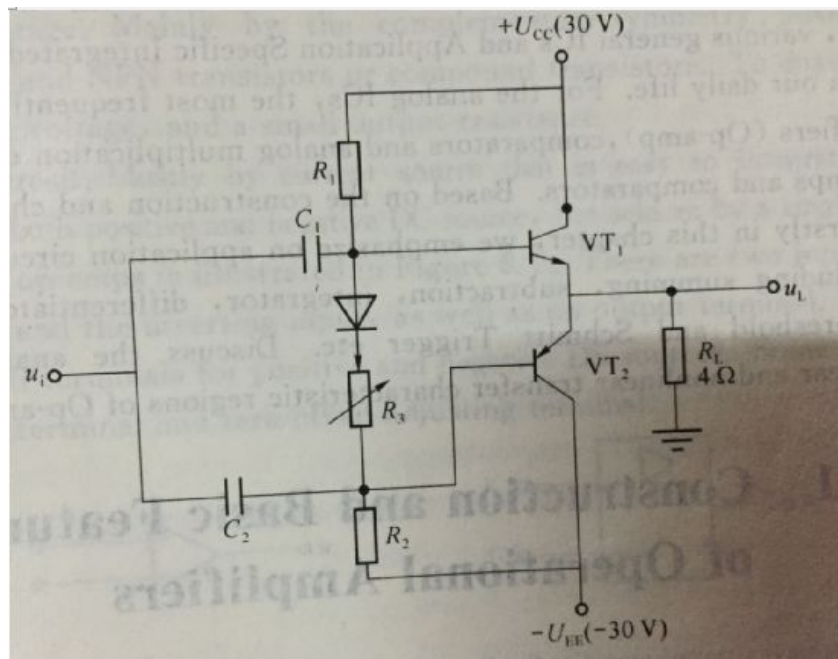
## Step4

The measurement of the amplifying circuit static state working point.

- Judge triode's polarity and the quality with the multitester.
- According to Figure 9.1 junction circuit, content direct-current power supply, measure the voltage and calculate the voltage and current.

## Step5

According to figure 9.2 junction circuit, adjust  $R_p$  to cause  $V_c$  to be equal to 6V. Adjust signal generator's output for the sinusoidal signal of  $f = 1\text{kHz}$ ,  $U_s = 500\text{ mV}$ , and connect to Figure 9.2 electric circuit's A spot, through  $R_1$   $R_2$  attenuation 100 times, the signal which the  $U_i$  obtain 5mV, and observe  $U_i$ ,  $U_o$  signal, pay attention to phase



## **PROBLEMS ENCOUNTERED**

The errors form resistance precision and operation zero draft, zero temperature .From the begaining, our circuit is not very perfect, so we change it and we can measure it after then.Voltage-following circuit is roughly equal to  $U_o$  and error is small when the voltage is added to 3V, measurement value are not similar because of the amplifier itself.uct various mathemat

## **CONCLUSION**

An op-amp is connected with strong negative feedback to ensure its operation in the linear region. Under this condition, op-amps are often used to construct various mathematical operation circuits, including multiplication with a constant gain, summing, subtraction, differentiator and integrator etc.

Put the measured static working point, voltage gain, input resistance, output resistace and calculated values to compare and analyse the causes of errors.

For the analysis method, you can take used of the features of virtue short and virtue open.

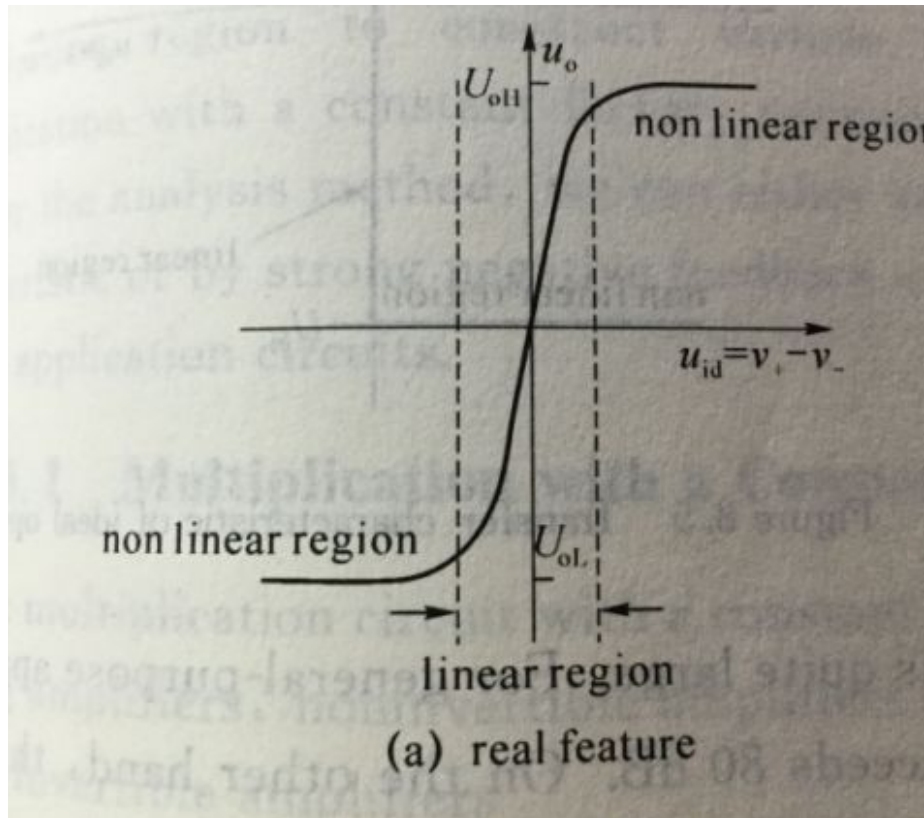
I wil call you this week to go on discussing our experiment and study the project since there are still many potential area related to this science topic. And any possible follow up you may wish us to do.

## **RECOMMENDATIONS**

On the basis of these conclusions, we recommend the following actions for the project.

1. Conduct the current tests two more times
2. Add testing for nitrogen. With the phosphate level deing so high, nitrogen might also be present. If it is, then fertilizer could be in the water.

## APPENDIX A





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June 6, 2015  
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BUPT University

## **LABORATORY REPORT**

### **TRANSISTOR AMPLIFYING CIRCUIT**

We have completed our three days project on the study of the transistor amplifying circuit. The aim of this experiment is such like this;

1. Grasp the measuring method of the amplifying circuit static state working point and analyze the influence of the static state working point to the amplifier performance.
2. Grasp the measuring method of the amplifying circuit voltage amplification gain and the most greatly not distorted voltage.
3. Grasp the measuring method of the amplifying circuit input resistance and the output impedance.

This report mentions all completed tests and discusses the test results. We scores well on many of the test, but we are concerned about several problems, such as the error that resulted from the equipment. The few problems we observed during our study have led us to recommend that several additional tests should be completed.

Thank you for the opportunity to complete this project. We look forward to working with you on further tests for the science area.

Sincerely,  
Weiping Zhu  
Student from Bupt

