

الجمهورية الجزائرية الديمقراطية الشعبية
PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
وزارة التعليم العالي والبحث العلمي
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH
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Faculty of Technology
Socle Commun (ST)
First Year (ST-REE-ING), 2nd Semester
Physics practical work II

5th Practical Work
Oscilloscope

Date:...../...../.....

Professor:.....

First Name	Last Name	Group	Sub-Group	Prep Mark	Final Mark

Academic Year: 2023/2024

1. Purpose of the experiment

The goal of this work is to manipulate the oscilloscope and the GBF (Low Frequency Generator).
Through:

- Know how to use the multiple controls visible on the front of each device.
- Know how to measure amplitude (voltage), frequency and phase shift.

2. Preparation work

Before arriving at the laboratory, try to read and prepare the practical work, discuss the following points:

- Definition and description of a cathode ray oscilloscope,
- Principle of operation and scope of use of an oscilloscope,
- Handling and using an oscilloscope.

3. Manipulation

a. Materials used

- + A cathode oscilloscope,
- + A DC (contained current) and AC (alternating current) voltage generator,
- + A low frequency generator (GBF),
- + Resistor and capacitor boxes,
- + Voltmeter (or multimeter).

+ Before you start :

- + Locate the buttons on the oscilloscope that allow:
 - a) Turn on the device.
 - b) To adjust the brightness and fineness of the “line or spot”.
 - c) To adjust the fineness of the “line or spot”.
 - d) To center the “line or spot” on the screen, by↔..... , and in↕.....,
 - e) To change the scanning speed of the spot.
 - f) To change the vertical sensitivity of channel A (or 1).

- + Repair the entrance to the A channels (or 1): YA, Y1 or CH1 and B (or 2): YB, Y2 or CH2

a. Measuring a DC voltage

We give the following assembly:

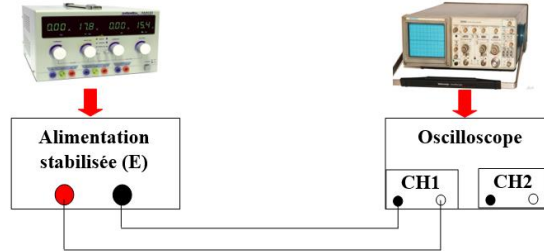


Figure 1. Assembly 01 in continuous mode.

According to the oscilloscope setting, note:

- + The time base used for this application
- + Measure the value of $E = \dots\dots V$ with a voltmeter (or multimeter).
- + Connect the oscilloscope to the generator according to the assembly shown in figure 1.
- + Operate the oscilloscope, then set the axes, the origin of the axes, light spot, etc.
- + put the oscilloscope in the DC position, and draw the resulting signal in table 1.
- + Vary the generator output voltage and observe the signal obtained and complete table 1.

Complete table 1 :

Continuous regime (DC)	$U_{\text{Generator}} \text{ (V)}$	$U_{\text{Voltmeter}} \text{ (V)}$	$U_{\text{Oscilloscope}} \text{ (V)}$
	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
$S_h = \dots\dots \text{ms/div}$ $S_v = \dots\dots \text{v/div}$			

b. Measuring frequency and period:

We recall that the frequency $f=1/T$ where T is the period of the signal.

We give the following assembly:

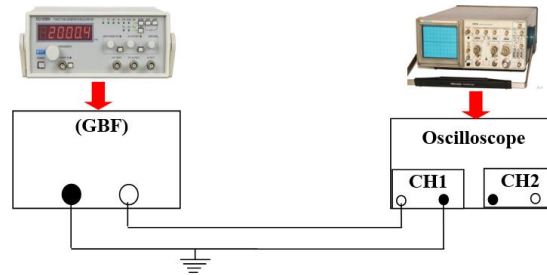


Figure 2 . Assembly 02 in alternative mode.

✚ Do the same work, for an alternative generator.

From the GBF, choose a sinusoidal signal, then complete the following table 2:

- ✚ Measure the amplitude ($U_{c\grave{a}c}$), the maximum value U_{max} , the period T and the frequency f ?
- ✚ What does the value measured by the voltmeter (or multimeter) mean in the three cases?
- ✚ put the oscilloscope in the AC position,
- ✚ Vary the generator output voltage, observe and draw the signal obtained.

Complete table 2:

	Sinusoidal	Triangular	Square
The signal			
	$S_h = \dots\dots\dots \text{ s/div } S_v = \dots\dots\dots \text{ v/div}$	$S_h = \dots\dots\dots \text{ s/div } S_v = \dots\dots\dots \text{ v/div}$	$S_h = \dots\dots\dots \text{ s/div } S_v = \dots\dots\dots \text{ v/div}$
$U_{\text{ Voltmeter (v)}}$	.....	.....	.....
$U_{c\grave{a}c} \text{ (v)}$	.....	.....	.....
$U_{max} \text{ (v)}$	.....	.....	.....
$U_{eff} \text{ (v)}$	.....	.....	.....
T (s)	.....	.....	.....
$f=1/T \text{ (Hz)}$	.....	.....	.....
$f_{GBF} \text{ (Hz)}$	.....	.....	.....

Question: According to the results in table 2, what is the relationship between U_{eff} and U_{max} for the three modes of the signal delivered.

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4. Conclusion

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