**PROTOCOL**to laboratory exercise

***RC-Sine-Wave-Oscillator***



|  |  |  |
| --- | --- | --- |
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| Grade | Employee | Signature |
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| ***RC-Sine-Wave-Oscillator*** | | |
| **Used Devices**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Nr. | Device | Manufactor | Type | Place Nr. | | 1. | Function Generator | HAMEG | HM8030-6 | - | | 2. | Power Supply | Conrad | PS2403D | - | | 3. | Oscilloscope | Tektronix | TDS 1001B | - |   **Used Programs**   |  |  |  | | --- | --- | --- | | Nr. | Name | Version | | 1. | Altium Designer | 13 | | 2. | Micro-Cap | 11 | | | |

ÜBUNGS-/ABGABE-DATUM

Klasse /Gruppe

NOTE

LEHRER

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# Tasks

Task of this laboratory exercise was to build a several RC-Oscillator Circuit.

1. Calculation
2. Setup and Realisation
3. Measurement of the -Dependency
4. Measurement (Time domain and FFT)
5. Calculation of the Total Harmonic Distortion (THD)

The following RC-Oscillator circuits were built.

* T-Filter Oscillator (Notch filter)
* Phase-Shifting-Oscillator

All Oscillators were provided with an unsymmetrical power supply.

The cut off frequency for all following calculations and setups was .

# T-Filter Oscillator (Notch filter)

## Calculations

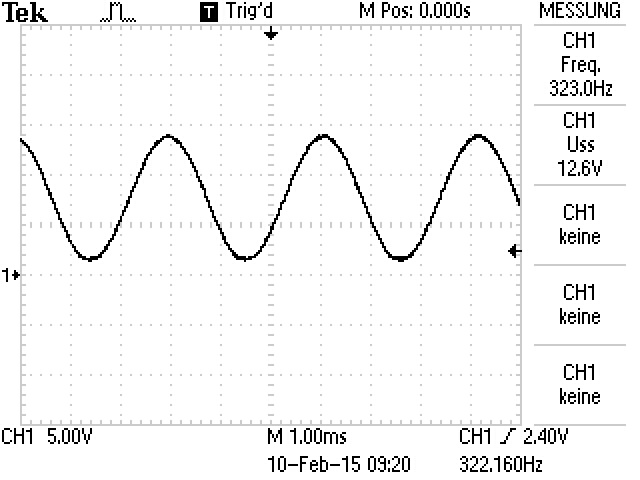
Based on the given cut off frequency of 300 Hz the values for R and C were calculated. It was assumed that the capacitor hast a value of 33nF.

## Measurement Circuit

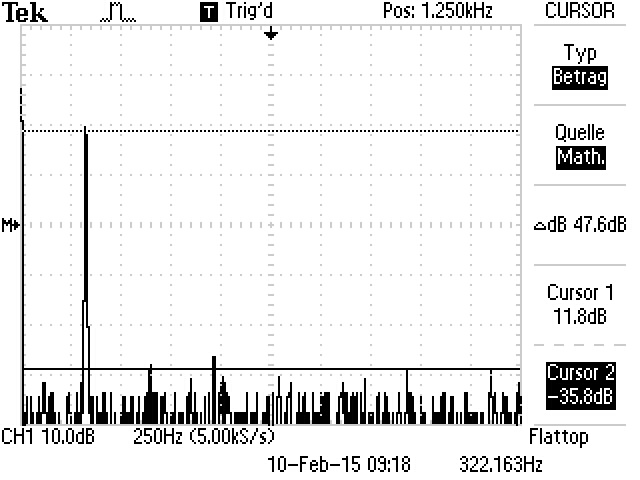
|  |  |
| --- | --- |
|  |  |

## - Dependency

## Measurement (Time Domain)



## Measurement (FFT)



## Total Harmonic Distortion

Based on above measurement (FFT) the difference between the cursors was taken for the following calculations. ()

# Phase-Shifting-Oscillator

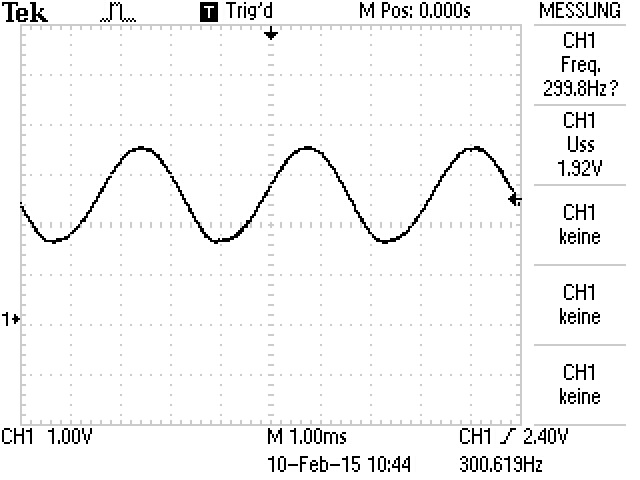
## Measurement Circuit

|  |  |
| --- | --- |
|  |  |

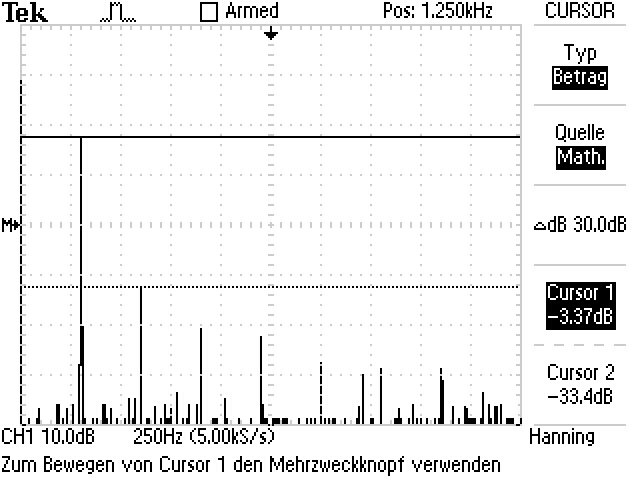
## - Dependency

The oscillator frequency has not changed with a modified supply voltage.

## Measurement (Time Domain)



## Measurement (FFT)



## Total Harmonic Distortion

Based on above measurement (FFT) the difference between the cursors was taken for the following calculations.

Second Harmonic

Third Harmonic

Fourth Harmonic