



ELECTRONICS HANDS-ON TRAINING

PARTICIPANT:

ALIAKSEI SHMARLOUSKI

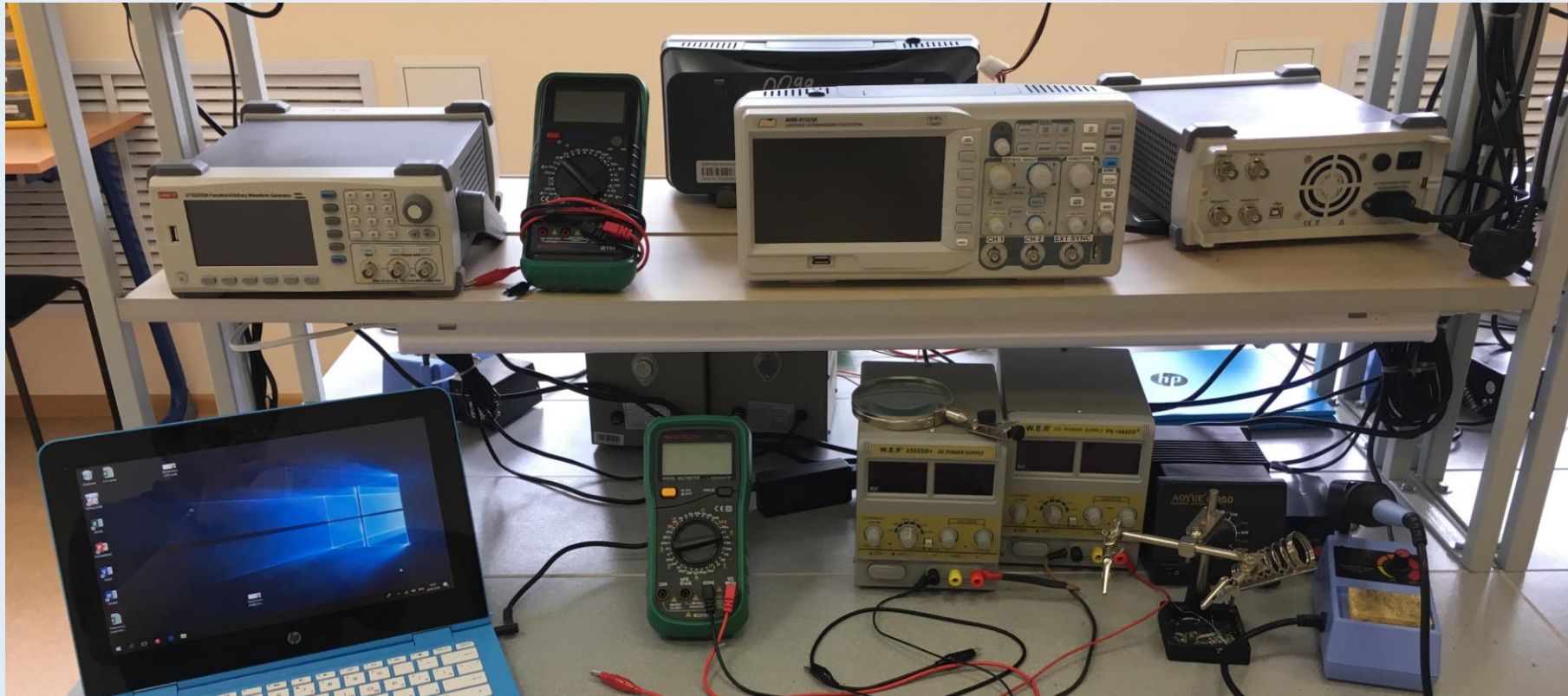
ISEI BSU NAMED AFTER A. D. SAKHAROV

LABORATORY: UNIVERSITY CENTER

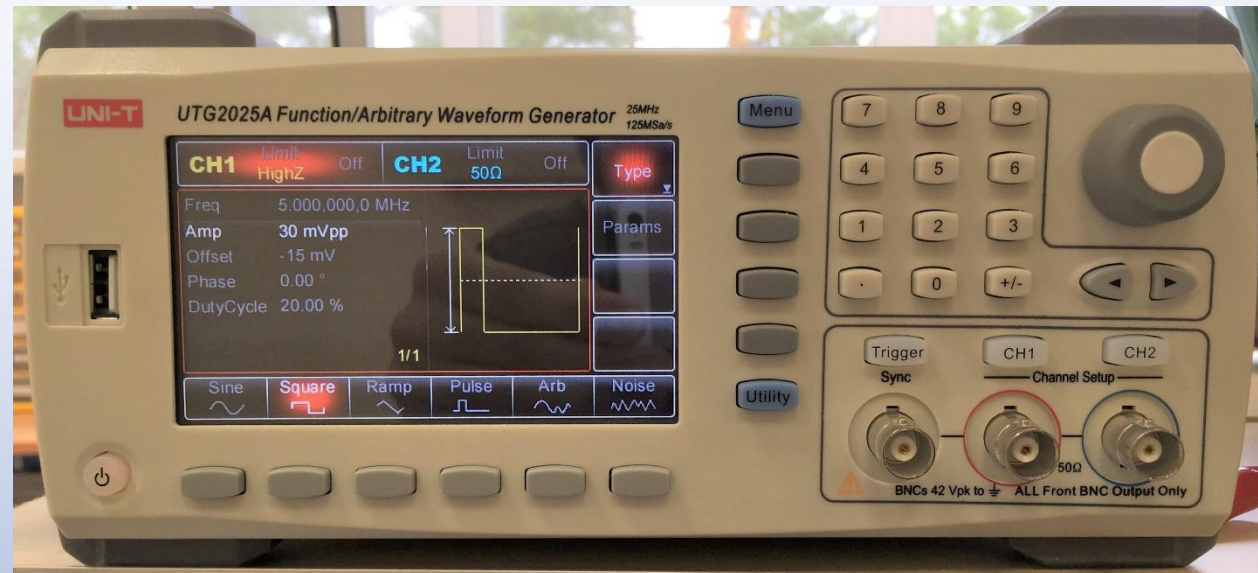
Supervisor: Dmitriy Belozarov

The aim of the project: Studying how to apply the basic radio electronic components, read electronic circuits and understand the basic principles of electronic devices

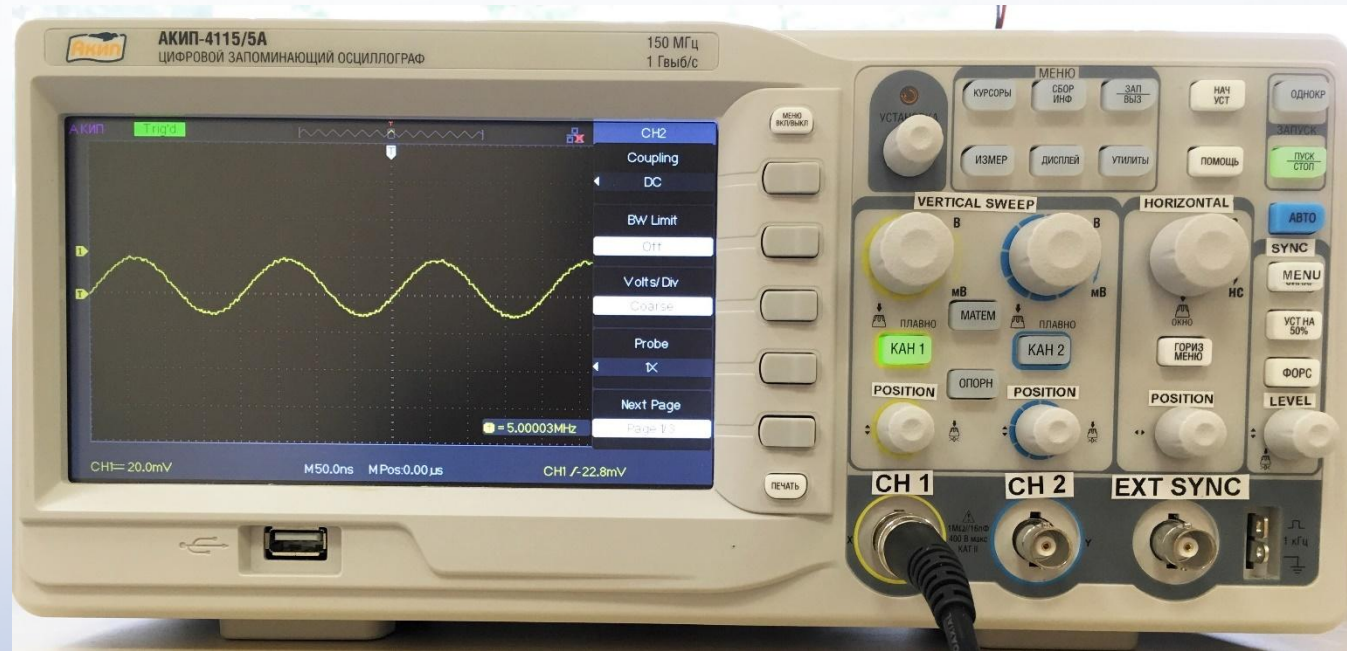
Used equipment: signal generator, an oscilloscope, multimeter, soldering iron



HOW MEASUREMENTS ARE CARRIED OUT



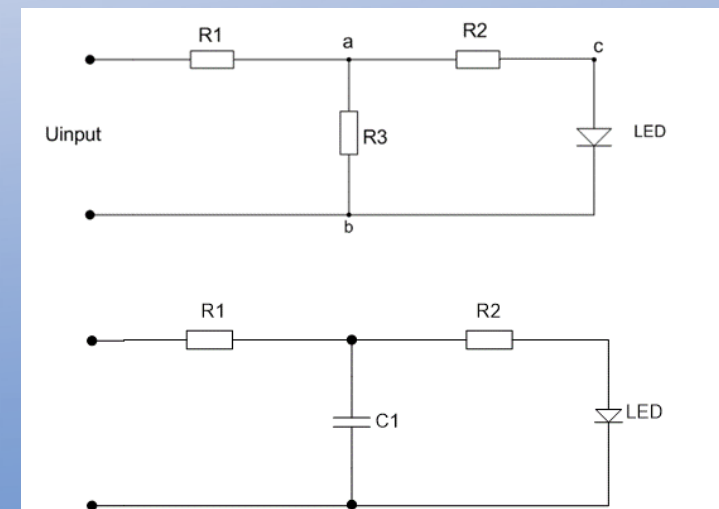
Generators produce electrical signals of various waveforms, frequency, phase and pulse width



Oscilloscopes allow the observation of varying signal voltages as a two-dimensional plot of one or more signals as a function of time

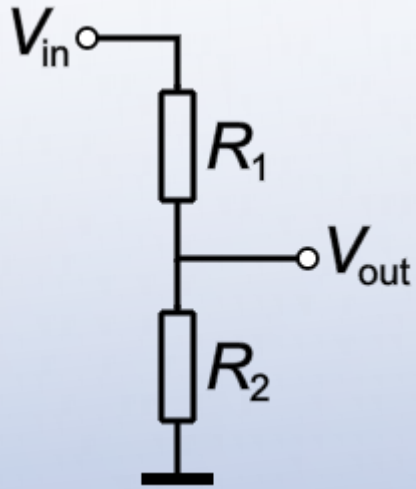
INTRODUCTION TO BASIC RADIOELEMENTS

- Resistors, capacitors, diodes, transistors
- Basic calculations – resistance, capacity
- Basic connection schemes – resistors, capacitors, voltage dividers



BASIC ELECTRONIC CIRCUITS

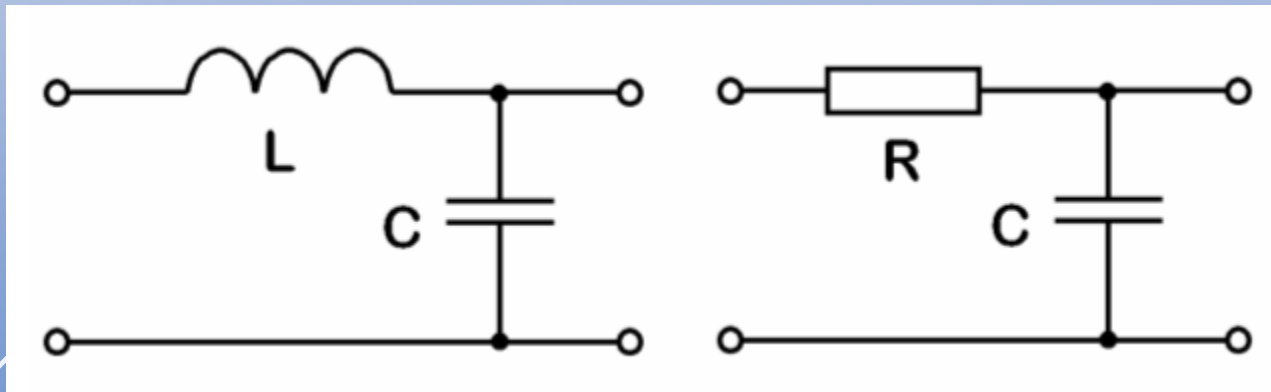
Voltage divider



$$V_{out} = V_{in} \cdot \frac{R_2}{R_1 + R_2}$$

R divider <50*R load MIN!!!

Low and High pass filters



$$X_c = \frac{1}{2\pi f_c C}$$

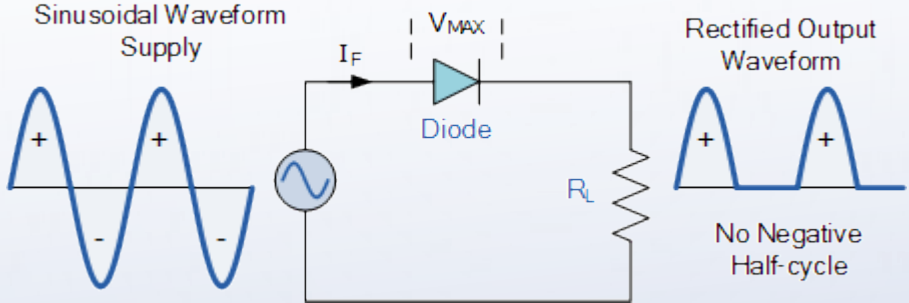
$$X_L = 2\pi f_L L$$

Resonance in LC-chain

It is more efficient because it is a second-order filter



CIRCUIT ACTIVE ELEMENTS

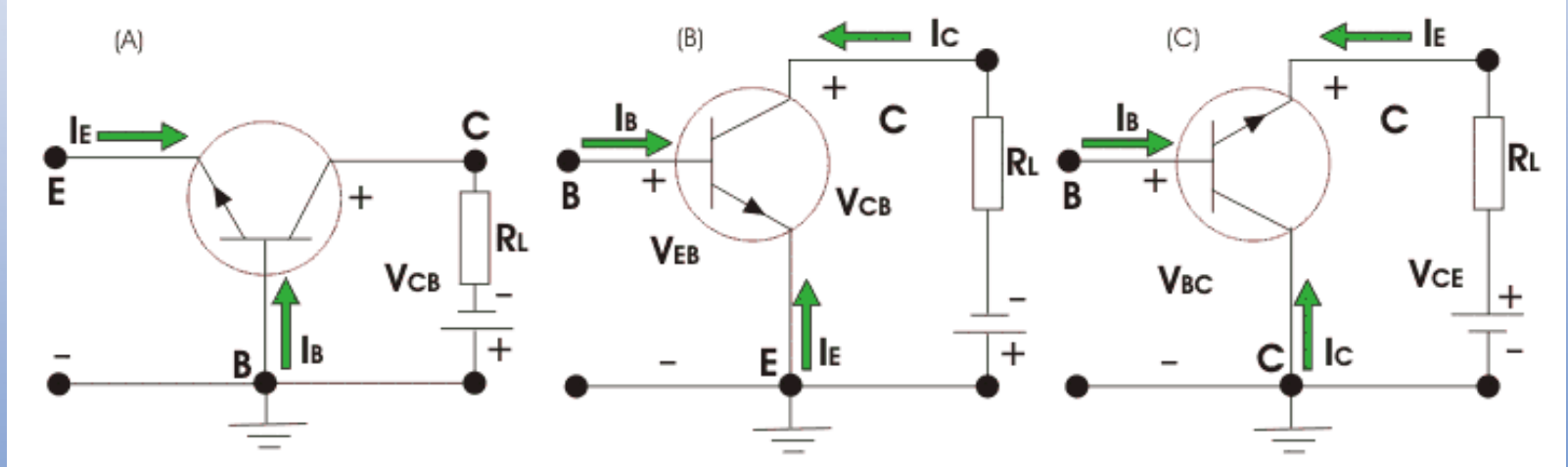


Diode rectifier circuit

Common Base

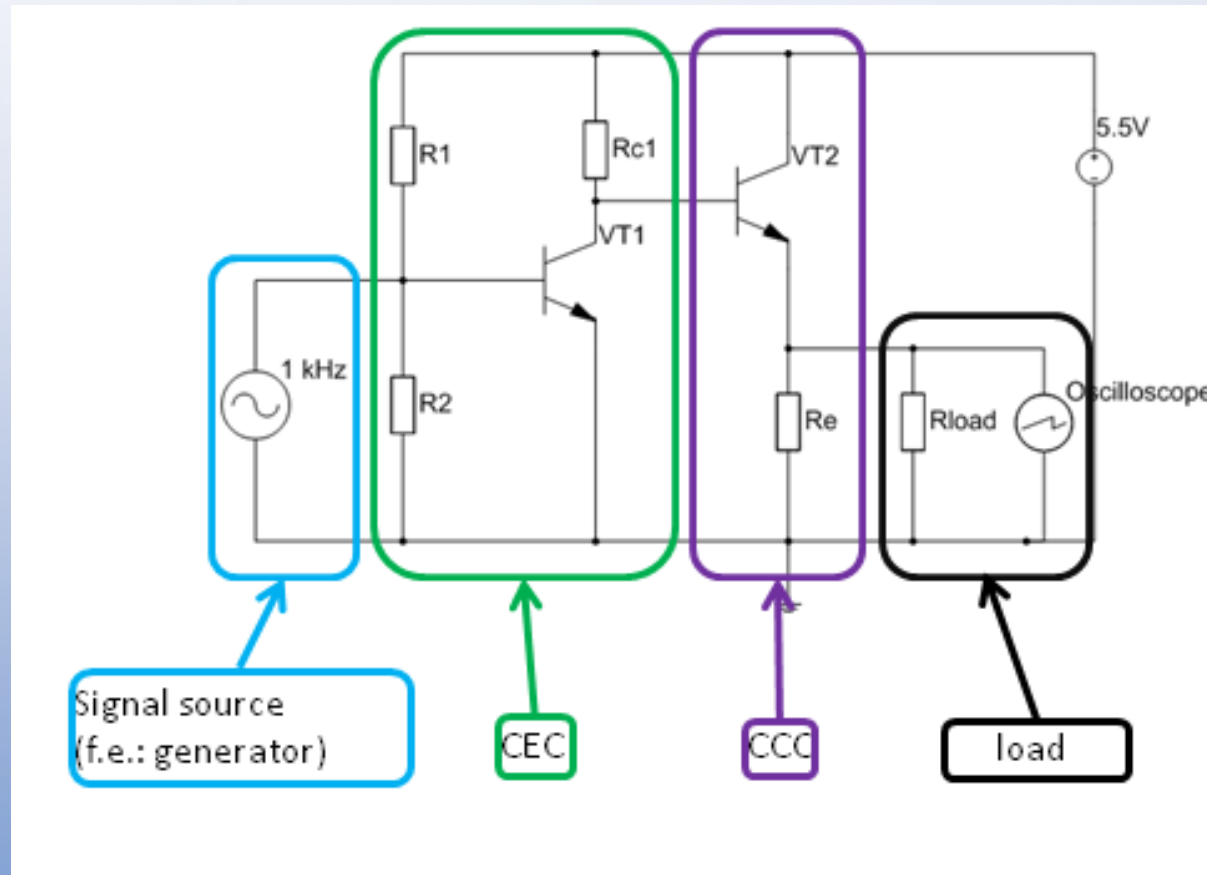
Common Emitter

Common Collector



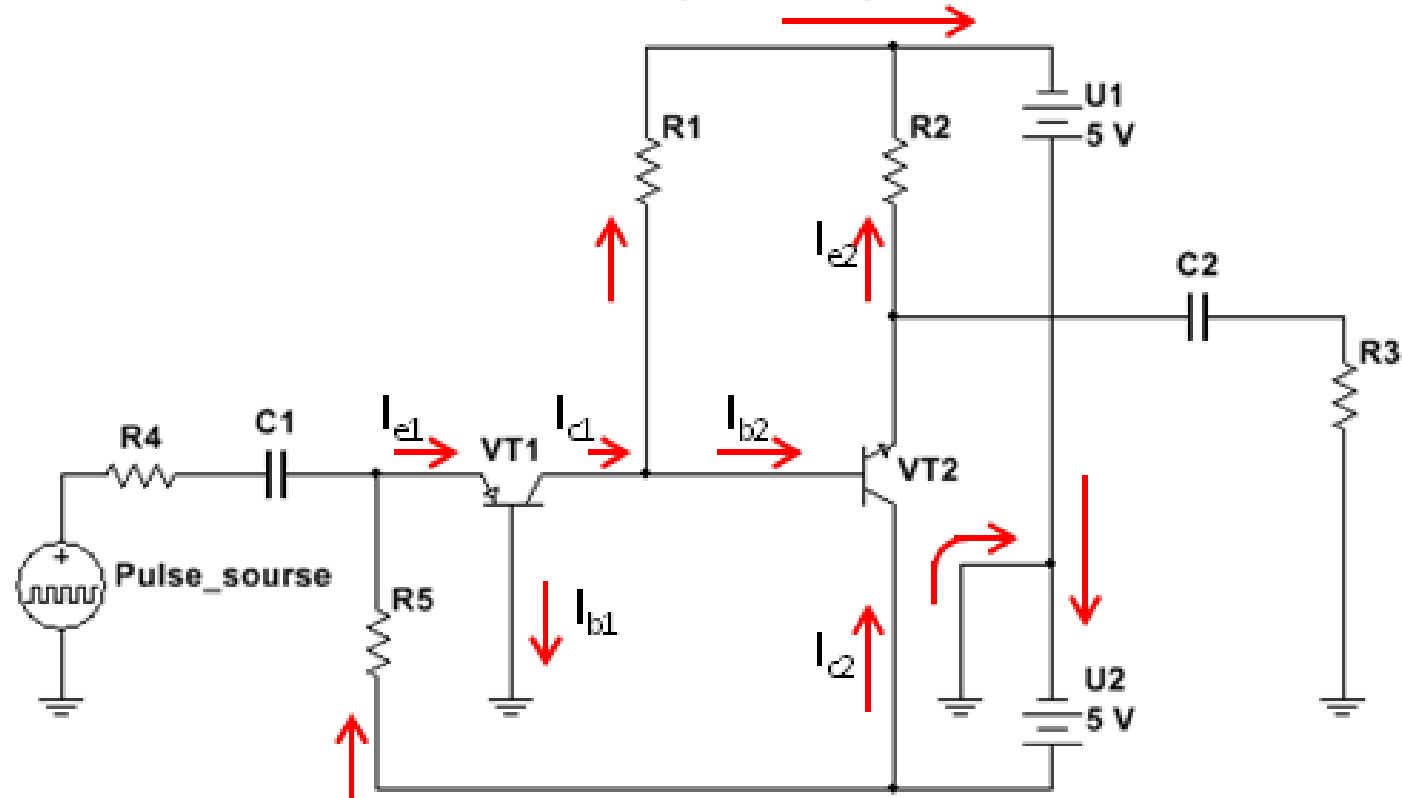
Main transistor circuits

CEC & CCC PREAMPLIFIER

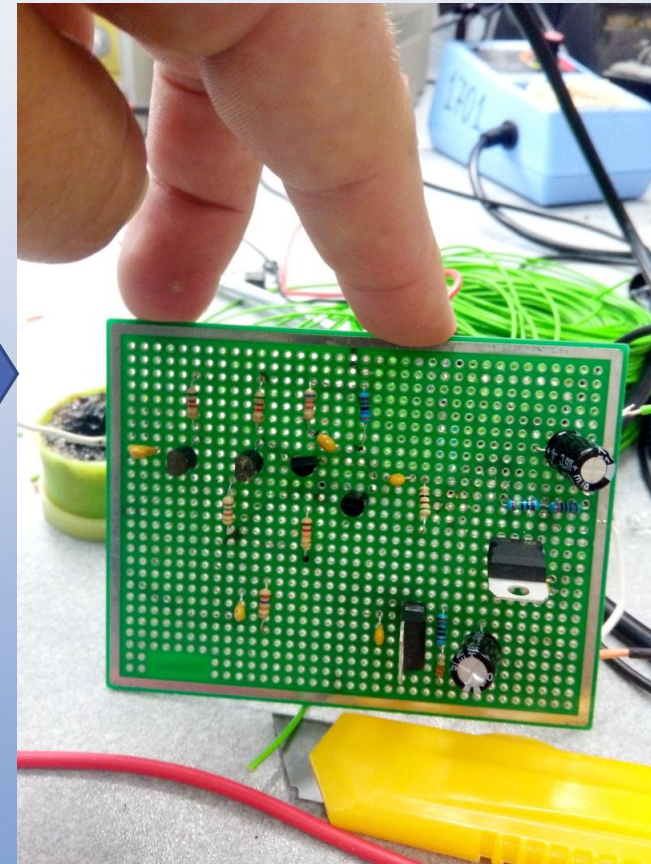
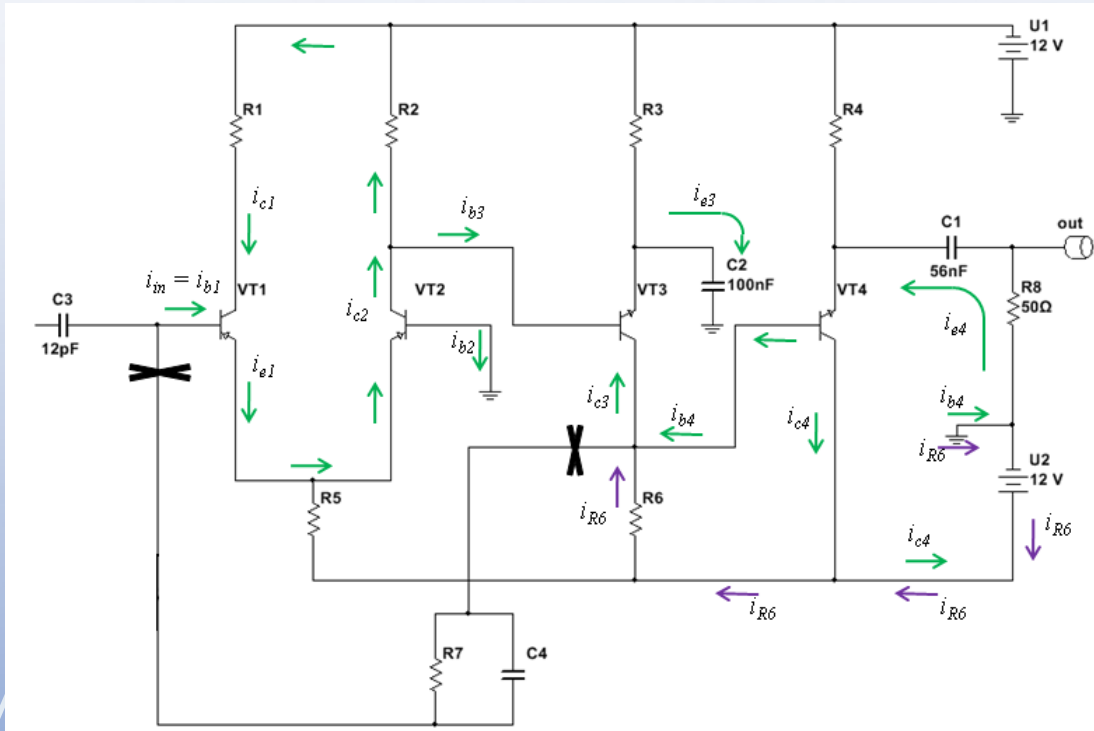


PREAMPLIFIER

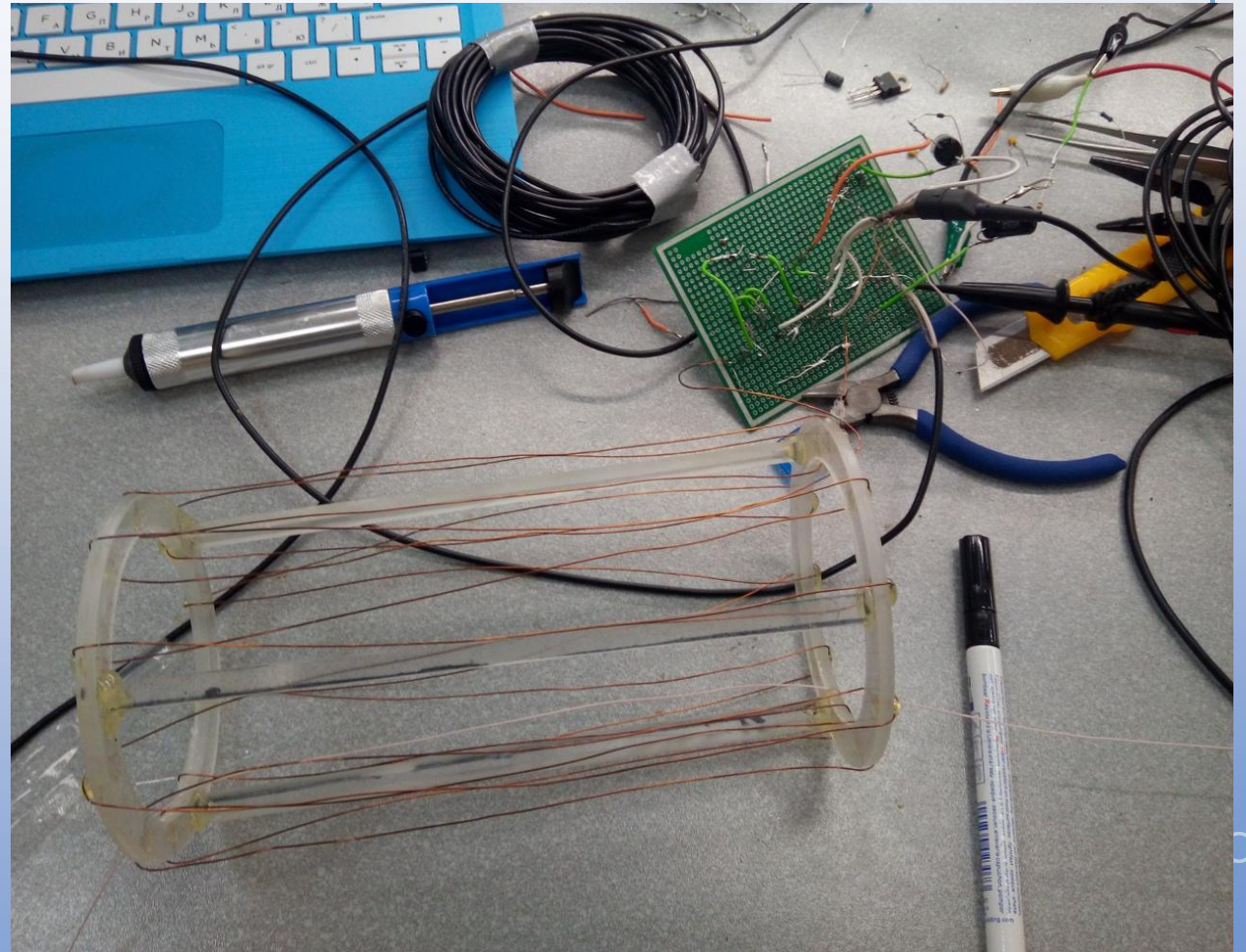
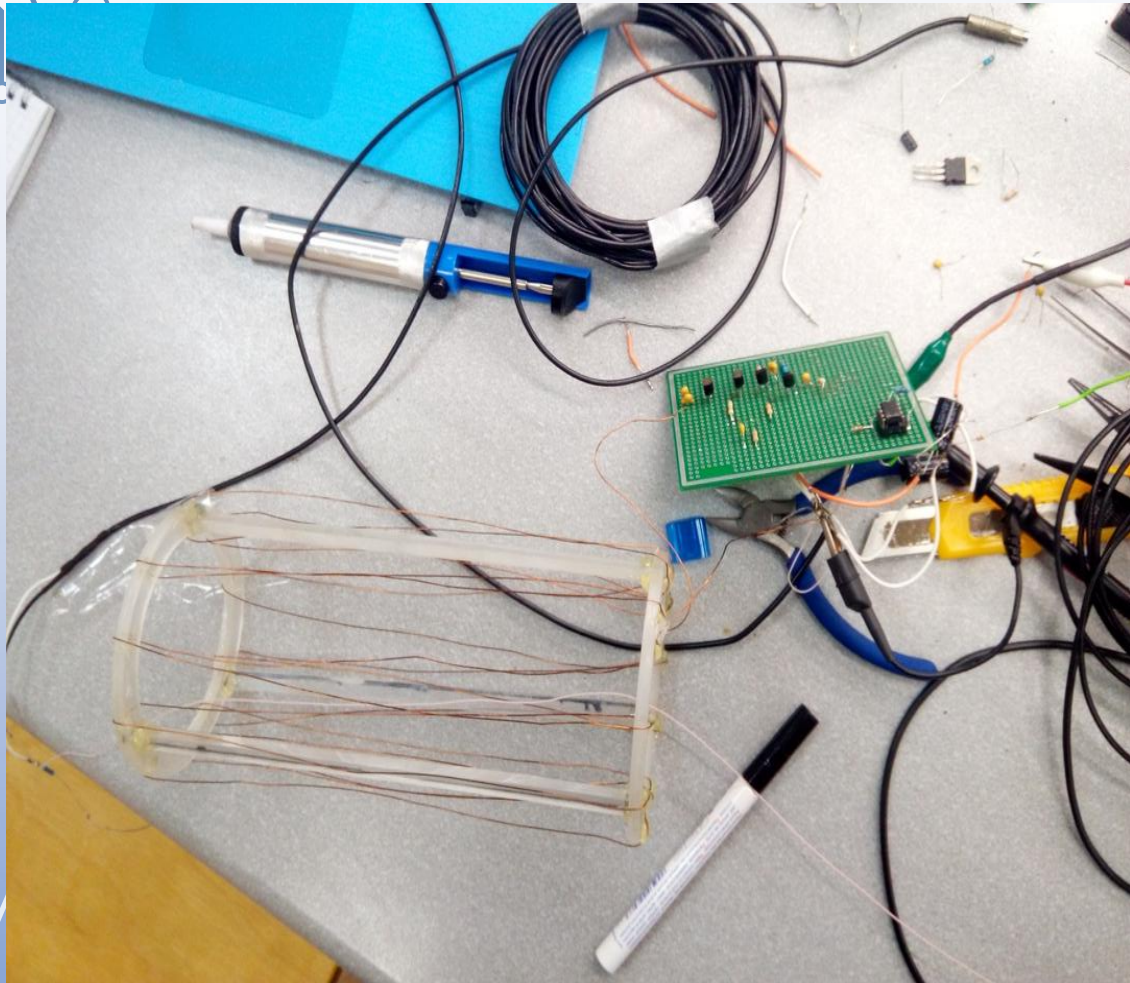
The preamplifier on CBC and CCC.



CHARGE SENSITIVE PREAMPLIFIER



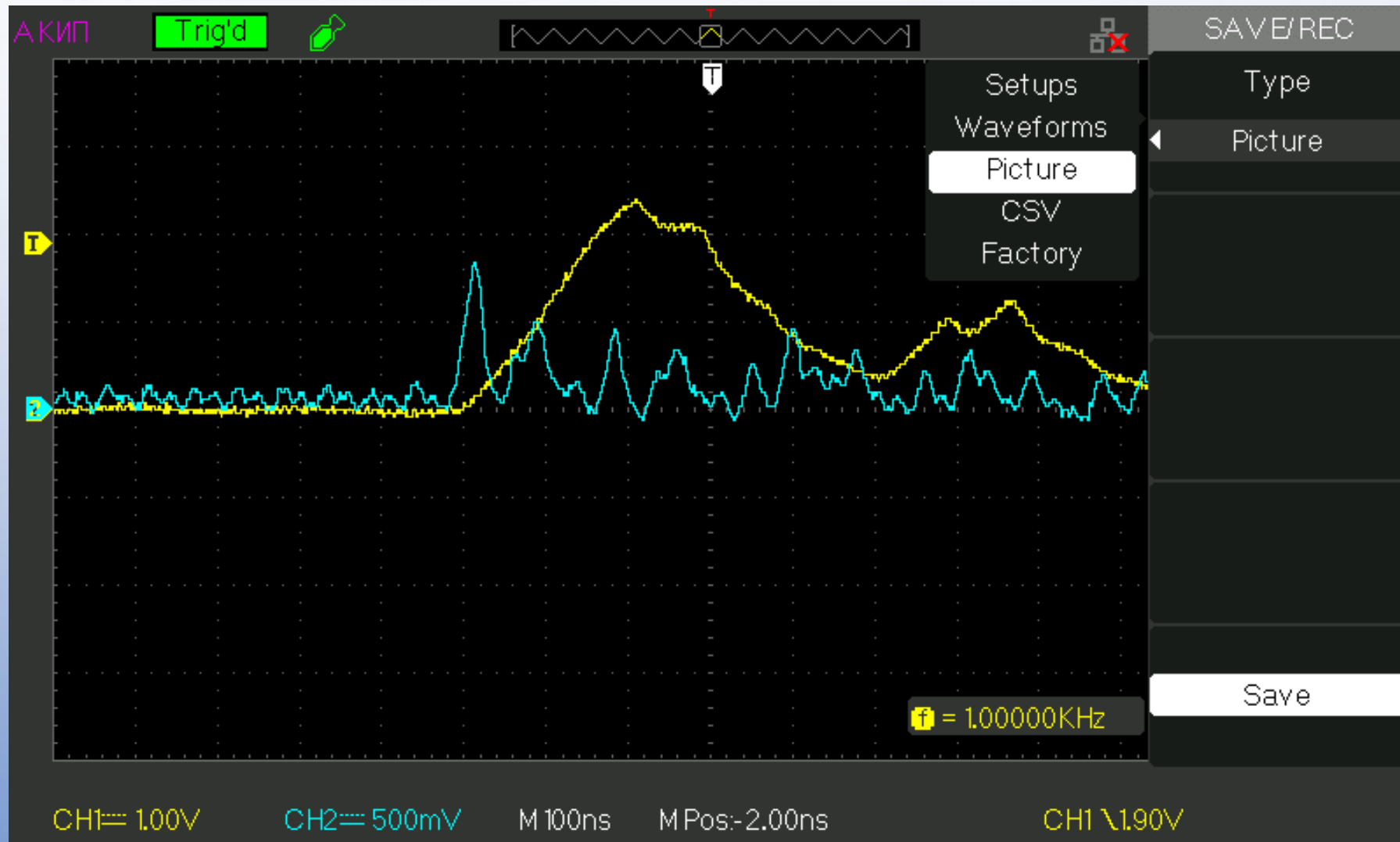
CURRENT DETECTORS



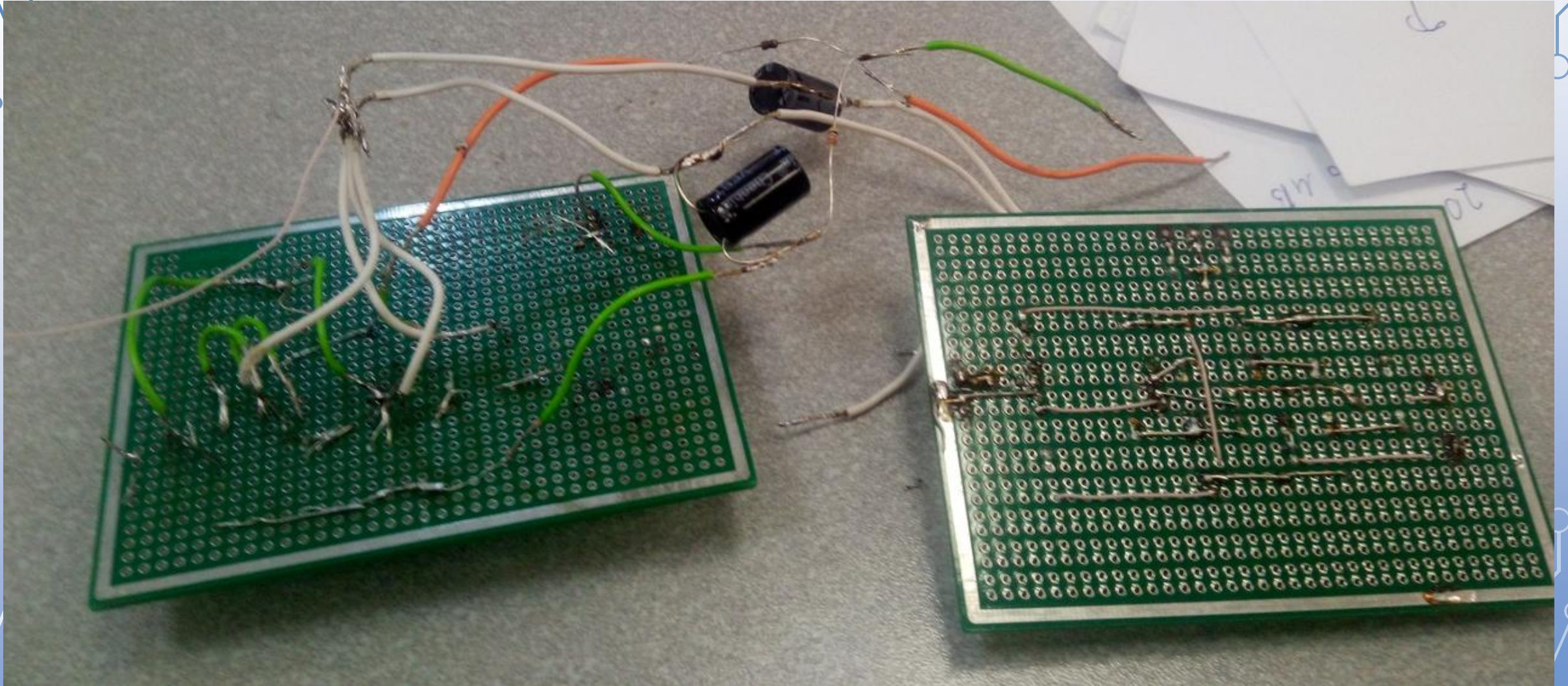
CURRENT DETECTORS



CURRENT DETECTORS



CURRENT DETECTORS



CH1 1.00V

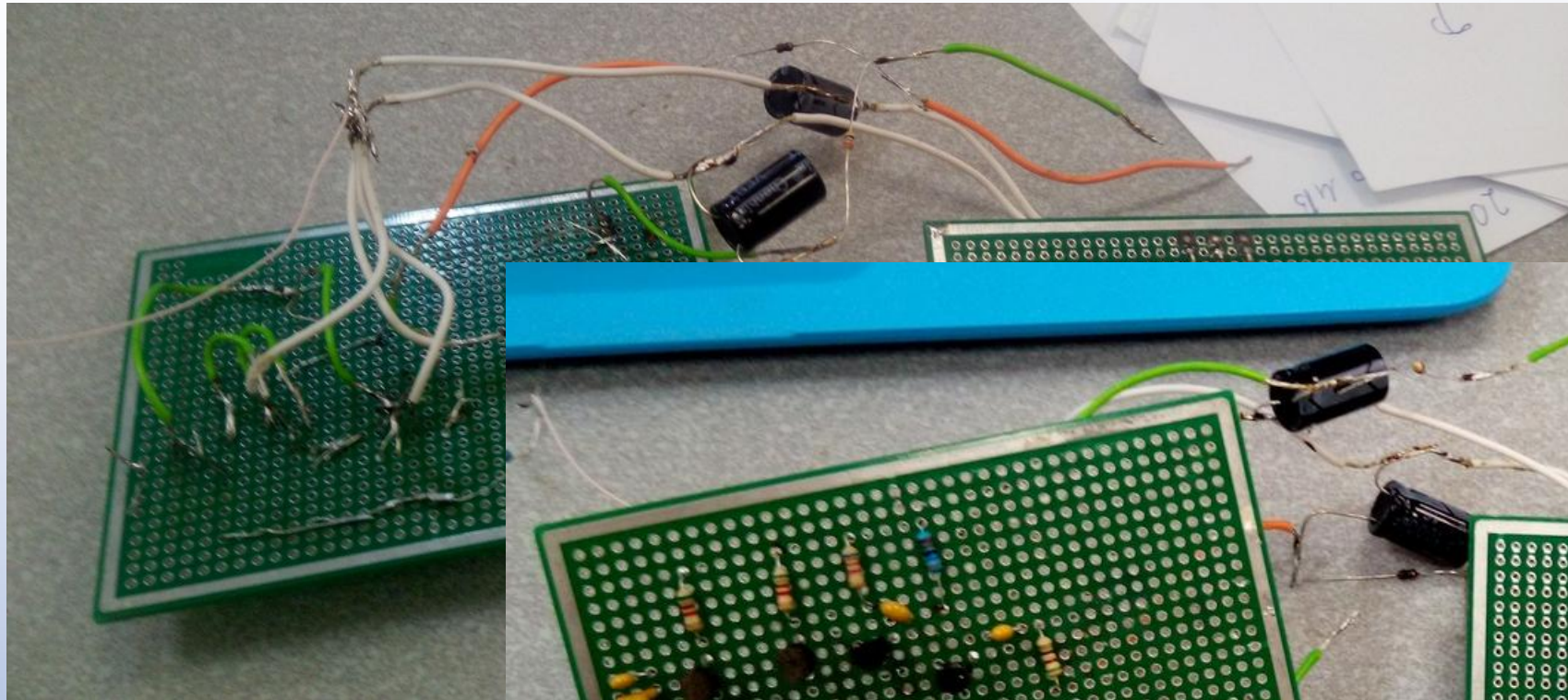
CH2 500mV

M 100ns

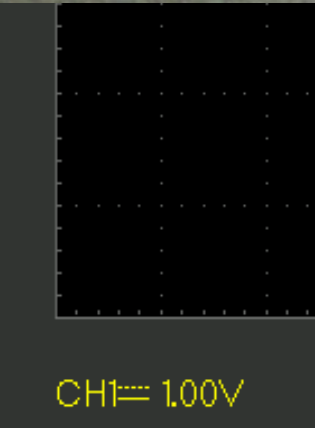
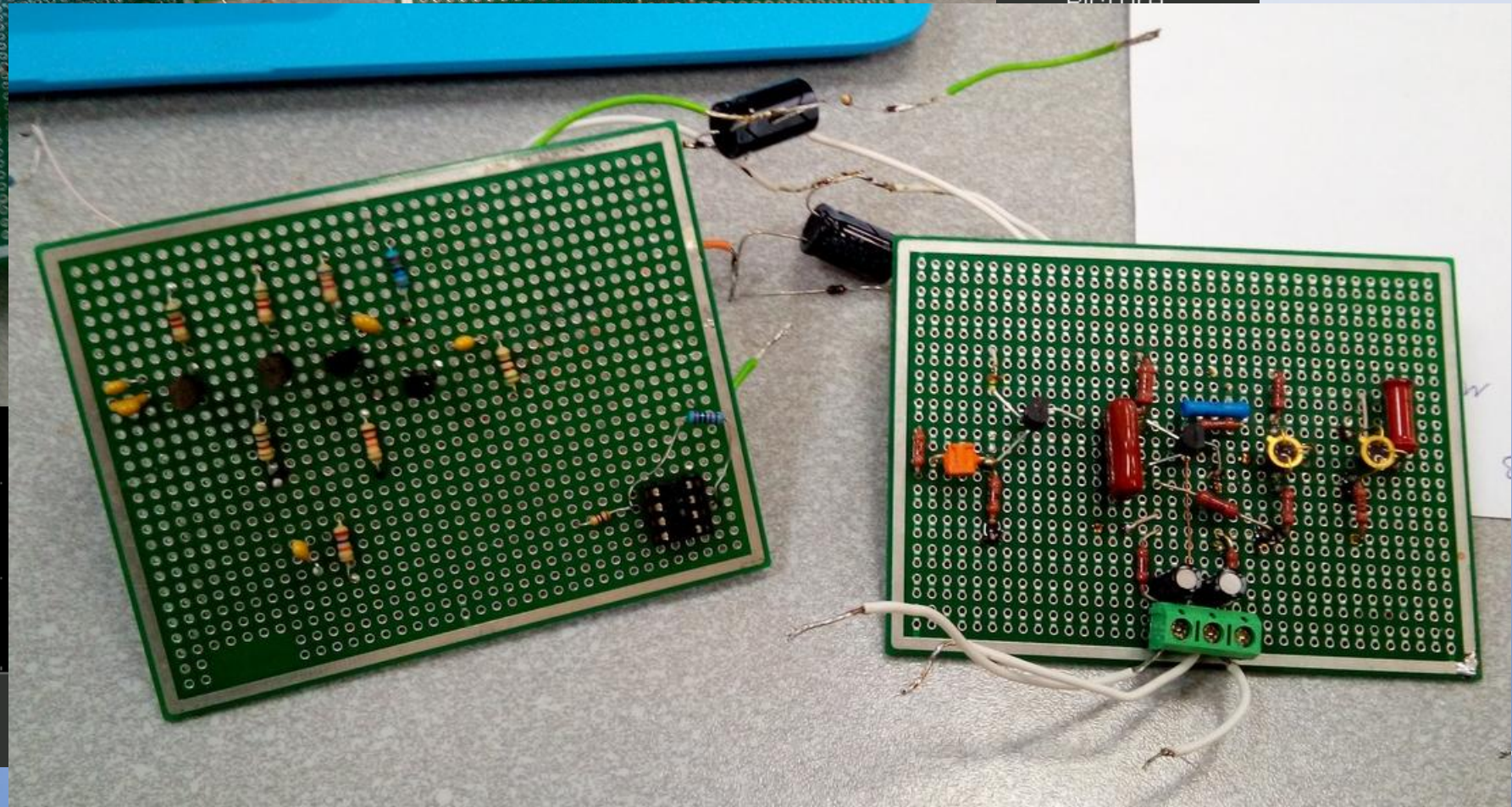
M Pos: -2.00ns

CH1 1.90V

CURRENT DETECTORS



SAVE/REC
Type
Picture



THE END

