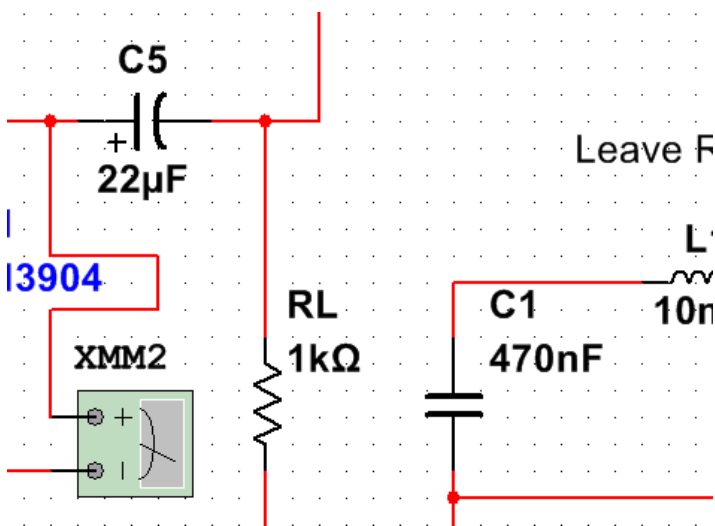


## 10 kHz-oscillator

The 10 kHz-oscillator consists of the lower-frequency BJT amplifier and the 10 kHz-phase-shifter that we have looked earlier in this course. The output of the BJT amplifier is connected to the input of the phase-shifter, and the output of the phase-shifter is connected to the input of the BJT amplifier.

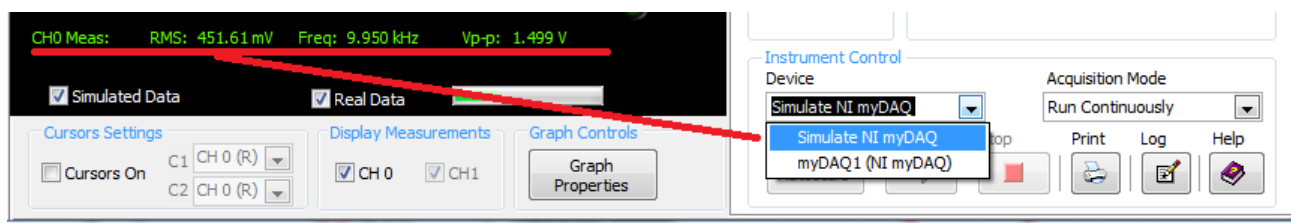
You can use the same bias point as previously,  $V_{CE} = 2\text{ V}$ ,  $V_{RC} = 2\text{ V}$ . When measuring the bias point, disconnect the feedback path either at the input or the output of the amplifier since a possible oscillation may interfere with the multimeter reading. The same applies in the simulation if you use the interactive instruments XMM1 and XMM2.

Example: The feedback path is disconnected at the output of the amplifier.



Simulate and measure the waveform of the voltage of RL with the oscilloscope. Note that you may need to adjust the time/div-setting (below 5ms) to see the waveforms correctly.

What are the simulated and measured frequencies and peak-to-peak voltages? You can immediately see the values by selecting the appropriate device:



**TURN OVER**

## **Prepare a short report (as pdf-file) that allows you to explain your results.**

The report should contain

1. Answers to the two questions above i.e. “Simulate and measure the waveform of the voltage of RL with the oscilloscope. What are the simulated and measured frequencies and peak-to-peak voltages?”
2. Picture(s) to illustrate the circuit in action.
3. Relevant quantities to report e.g. biasing and functioning of the circuit.
4. Describe also what do you observe when you “switch the circuit on” either in simulations or using myDAQ. Try changing setting of the potentiometer and checking how it affects the output.