

Laboratory 10: Electrocardiography

Purpose:

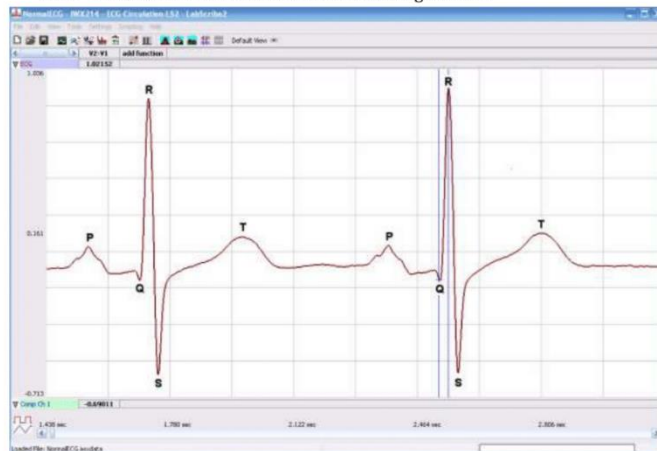
The purpose of Laboratory 10 Electrocardiography was to understand the electrical activity of the heart and how to measure the change in the electrical activity of the heart. Also to understand what the polarizations and repolarizations represent.

Procedure:

- To begin set up: Before powering on any devices, ensure that the IWX/214 unit is plugged in and connected to the laptop via a USB cable
- Verify that the C-AAMI-504 EEG cable is inserted into the isolated inputs of Channels 1 and 2 of the IWX/214. Confirm that the three color-coded lead wires are correctly placed in the lead pedestal of the C-AAMI-504 EEG cable. Insert the red, black, and green electrode lead wires into the corresponding color-coded sockets on the lead pedestal of the ECG cable. You can remove the white and brown lead wires, placing them neatly in the Iworx case, as they are not needed for Lab 10. However, they will need to be replaced after the week concludes.
- Once all connections are secure, FIRST power on the laptop and allow it to fully boot up before switching on the IWX/214 unit. Once the Iworx unit is powered on, the red indicator light on the Iworx unit should illuminate, and you may hear the USB chime from the laptop unless it is set to default mute.
- Open the Labscribe3 program by clicking on the Labscribe3 icon on the desktop. When the program opens, a window should pop up stating, "Hardware found IWX214:2008-1-24." Click "OK."
- In the second row from the top (File Edit View Tools Settings Advanced External Devices Help), click on the "Settings" tab. About one-third of the way down the drop-down window, you should find a tab called "Human Heart." Click on that tab, leading you to a tab named "ECG-HeartSounds." Click on that tab, and the main window will resemble the provided image after closing the PDF file.



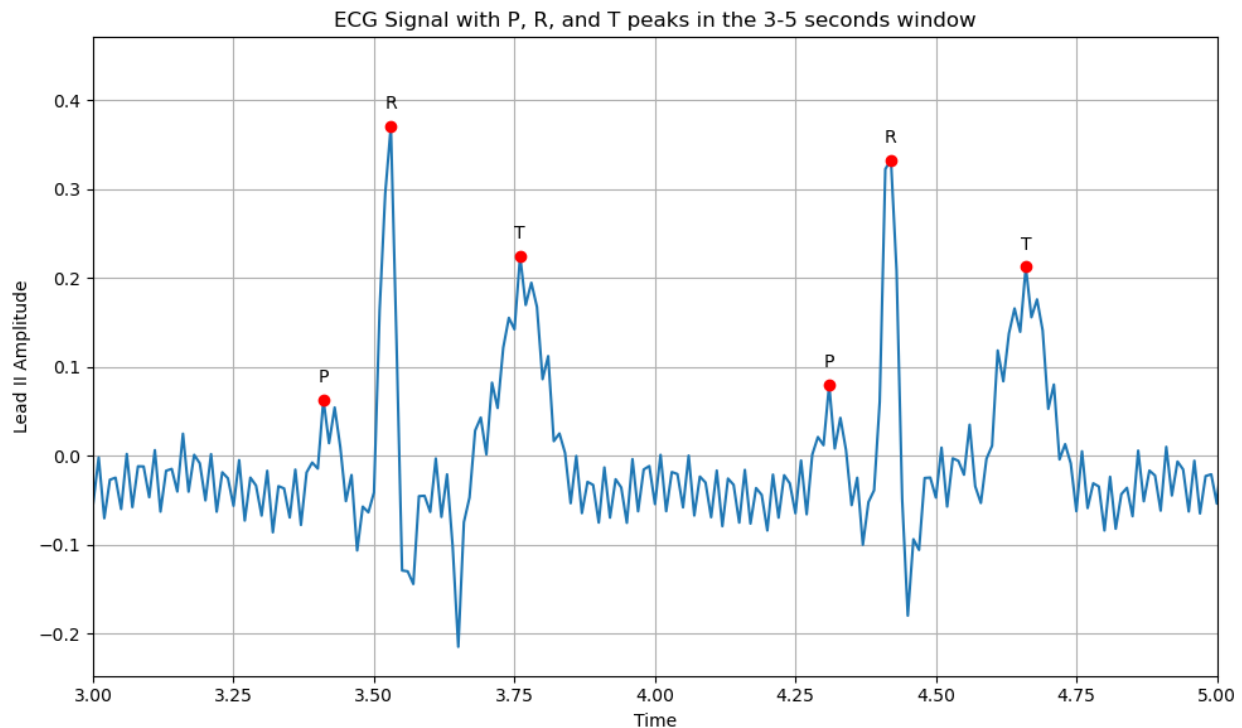
4. Since Lab 10 is about ECG only, we can hide the lower "Heart Sounds" row by clicking on the ▾ symbol to the left of the row label, then clicking on the "Hide" tab, and then "Yes". The main window then look something like this:



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- Remove the disposable ECG electrodes from their packaging and attach the lead wires to the electrodes while they are still on the plastic shield. Instruct the subject to remove all jewelry from their wrists and ankles. Use an alcohol swab to clean a region of skin on the subject's right wrist and the inside of both ankles. Allow the area to dry
- Affix the black (-1) electrode to the cleaned area on the right wrist. Repeat Steps 5 and 6 for the inside of the left ankle and the inside of the right ankle, arranging Lead II as follows:
- The black (-1) lead is attached to the right wrist.
- The red (+1) lead is connected to the left ankle.
- The green (Ground) lead is connected to the right ankle
- Instruct the subject to sit quietly with their hands in their lap to prevent movement that may affect the ECG trace. Any muscle movements in the arms or upper body can introduce noise in the form of electromyograms (EMGs) on the ECG recording

- Click the Record button on the upper right side of the LabScribe Main window. The signal should start scrolling across the screen. If Lead II appears upside down (inverted P, R, and T waves), click on the upside-down triangle next to "sA1:ECG 0.3-35Hz," then select the "Invert" option. Do this only once
- When you have a satisfactory trace, enter "<Subject's Name> Lead II" in the Mark box to the right of the Mark button. Press the Enter key to attach the comment to the data
- Click on the AutoScale tab at the upper margin of the ECG channel (second icon after "Hz"). Your recordings should resemble the figure in step #4. If ECG waves seem too compressed, consider clicking the tab above the "Mark" tab that resembles a snow-capped pyramid, labeled "Half Display Time."
- If you need to reverse this adjustment, click on the tab that looks like double pyramids ("Double Display Time") to the right of the Half Display Time tab. Record for approximately one minute, then click Stop to end the recording. Label one set of the five ECG waves (P, Q, R, S, and T), noting that cycles are similar but not identical, and distances between QRS complexes may vary slightly

Results:



Discussion:

In this lab the focus was being able to understand each component of what the EKG represents. The P represents atrial depolarization, the R represents the QRS complex that shows ventricular

depolarization and the T stands for ventricular repolarization. This lab showed me a more in-depth representation of the EKG and I believe it did a good job and definitely expanded my knowledge of it.

Conclusion:

In conclusion, I thought this lab was an interesting experiment but I do believe its served its purpose on introducing more about the EKG and how it measures and what it measures. It did take a while to set up for my partner and I but I did enjoy this lab.