Experiment HN-9: Game Show Physiology

Equipment Required

PC or Mac Computer

IXTA, USB cable, IXTA power supply

2 – EM-220 Event Markers

2 – PT-104 Pulse Plethysmographs

Contestant Note Cards or Review Flash Cards (use the ones for your textbook)

Event Marker Setup

1. Locate the 2 - EM-220 event markers.
2. Plug the connector to the EM-220 event marker into the EM1 Channel input on the back of the IXTA. Plug the 2nd EM-200 into channel EM2.

Figure HN-9-S1: The IXTA with the EM-220 event marker. The 2nd event marker will be plugged into EM2.

3. Locate the 2 – PT-104 Pulse Plethysmographs. Plug one into channel A5 and the 2nd into channel A6.

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Figure HN-9-S2: The PT-104 pulse sensor. These will be plugged into channels A5 and A6.

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Experiment HN-9: Game Show Physiology

Exercise 1: Reaction Time and Heart Rate

Aim: To measure the reaction time and heart rate of two subjects involved in a Game Show type scenario.

Approximate Time: 30-60 minutes depending on the questions and length of the "game"

Procedure

1. Read all instructions carefully before beginning to record.
2. Information for the subjects:
    - Instruct the subjects to sit in a chair and face the "Host".
    - They should hold the event marker in a manner that enables the subject to push the button as quickly as possible.
    - Place the PT-104 (pulse sensor) on the volar portion of the thumb or middle finger of the hand that is *not* holding the event marker. Make sure the sensor is comfortably snug, but not too tight that it cuts off circulation.
    - As soon as the subject knows the answer to the question or clue, they will click the event marker and state the answer.
3. Directions for the "Host"
    - The person who is the Host is in charge of verbally asking questions or giving single word clues to the "Contestants".
    - If this person is also the computer operator, they will click the F1 key as soon as the question or clue is asked. If another person is operating the computer, this will be their responsibility.
    - The computer operator will also need to keep track if the question was answered correctly or incorrectly. Any incorrect answers will not be counted and can be given to the opposing "contestant".
    - In this exercise, the "Contestants" will answer a total of 10 questions.

Beginning Recording

1. Type **Game Show Begins** in the Mark box.
2. Click on the Record button.
3. Click the Mark button to mark the recording.
4. Click the event marker as soon as you know they answer to be the FIRST to say that you know the answer to the question or the one-word clue.

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- If the contestant answers incorrectly, give the same question or clue to the opponent. They must "ring in" with the event marker when they think they know the answer.

5. After the last question has been answered, click Stop to halt recording.
6. Select Save As in the File menu, type a name for the file. Click on the Save button to save the data file.

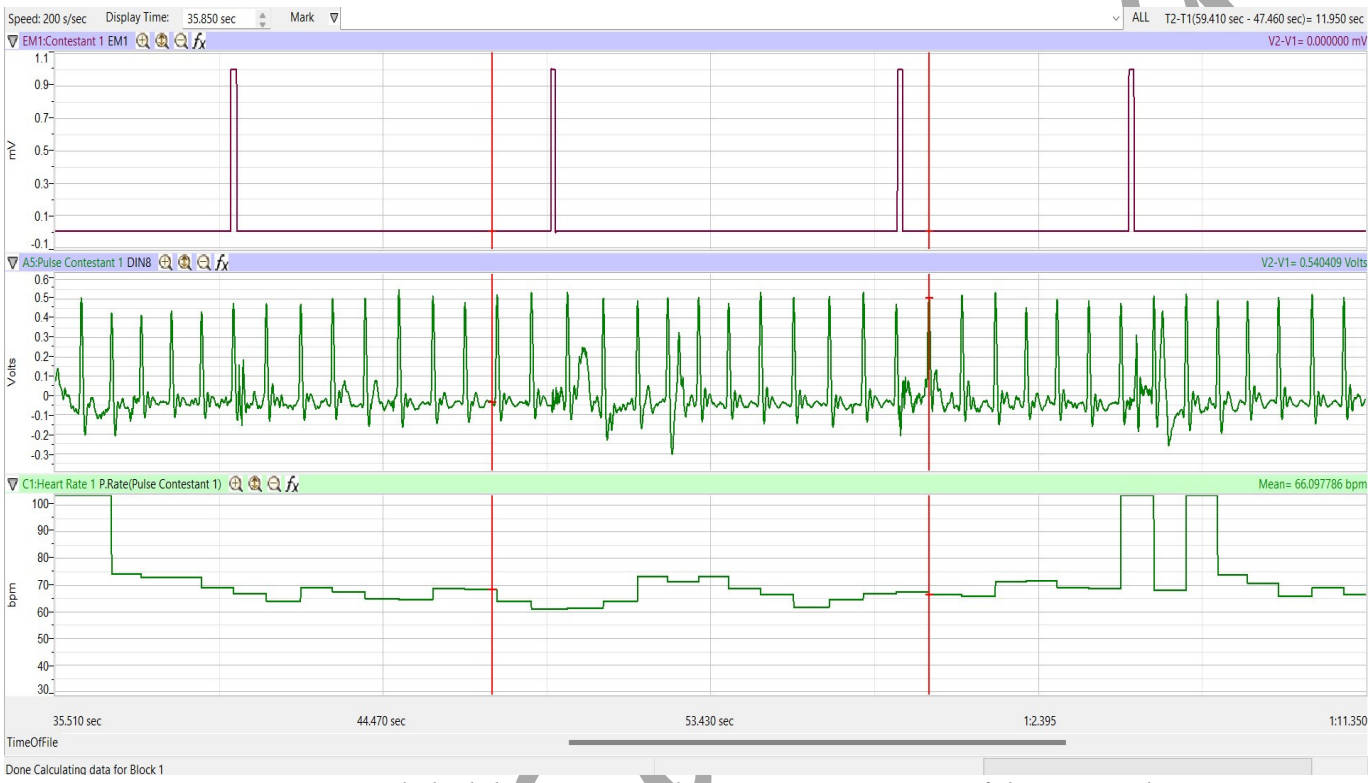

Figure HN-8-L1: Data recorded while answering three questions as part of the Game Show Scenario. Note that the data are only showing one contestant, the other has been minimized on screen to make viewing easier.

Data Analysis

1. Scroll to the beginning of the data recorded for Exercise 1 to display the first question/answer combination on the Main window.
2. Use the Display Time icons to adjust the Display Time of the Main window to show both the question made with the F1 key and the mark made by the event marker for the contestant's response.

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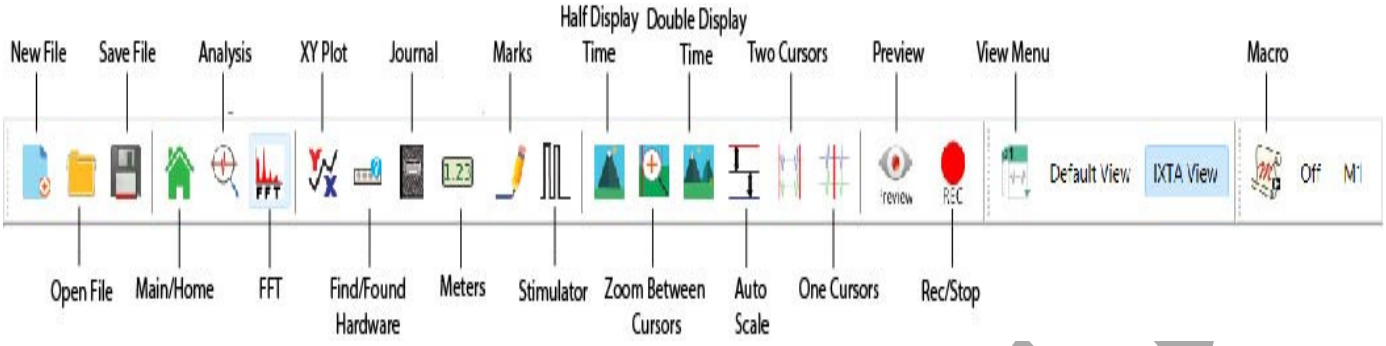

Figure HN-8-L2: The LabScribe toolbar.

3. Use the mouse to click on and drag a cursor to the mark made by pressing the F1 key. Drag the other cursor to the leading edge of the square wave made by the subject responding to the question by pressing the event marker.
4. Once the cursors are placed in the correct positions for determining the reaction time and heart rate, record the value for T2-T1 and Mean HR on the data table below.
    - T2-T1 is located in the upper right corner of the window.
    - Mean Heart Rate is located on the right edge of the Heart Rate channel – labeled "Mean".
5. If you want to use the on-screen notebook, transfer the data to the Analysis window and record the data for T2-T1 and Mean from the Heart Rate channel into the Journal. These values can be recorded by typing its name and value directly into the Journal. You may also record any data on separate data tables.
    - Place the cursors at the locations used to measure the reaction time and heart rate.
    - Transfer the name of the T2-T1 and Mean functions to the Journal using the Add Title to Journal function in the Heart Rate Channel pull-down menu accessed by clicking the arrow to the left of the channel name.
    - Transfer the value for T2-T1 and Mean to the Journal using the Add Ch. Data to Journal function in the Heart Rate Channel pull-down menu.
    - Make sure to note whether the response is from Contestant 1 or Contestant 2.
8. Once the reaction time and heart rate of the first question/answer is measured and recorded, use the scroll bar at the bottom of the window to move the data to the second trial onto the window.
9. Repeat the analysis steps on the data from the second question/answer trial.
10. Use the same techniques to measure the reaction times and heart rates from the other eight trials.
11. Once the reaction times and heart rates for all 10 questions have been measured and recorded, open the Journal and use the values to determine the mean reaction time and heart rate of the each of the contestants. Record the individual times and heart rates for each Q/A trial and the means in Table 1.

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Figure HN-8-L3: A single trial for one question and answer by Contestant 1. The two cursors are positioned at the beginning of the F1 mark and on the leading edge of mark made by the event marker. Reaction time in this example is 2.450 sec and Mean HR is 65 bpm.

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Table HN-8-L1: Reaction Times and Heart Rates for Questions (or clues) 1-10.

QUESTION	CONTESTANT 1		CONTESTANT 2	
	Time (sec)	Heart Rate (bpm)	Time (sec)	Heart Rate (bpm)
Question 1				
Question 2				
Question 3				
Question 4				
Question 5				
Question 6				
Question 7				
Question 8				
Question 9				
Question 10				
MEAN				

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