Experiment HN-13: Conditioned Response

Equipment Required

PC or Mac Computer

IXTA, USB cable, IXTA power supply

EM-220 Event marker

HV stimulator lead wires for IXTA

Event Marker Setup

1. Locate the EM-220 event marker. Plug the connector into the EM1 Channel input on the back of the IXTA.

Figure HN-13-S2: The IXTA with the EM-220 event marker.

IWorx Sample Lab

3. Locate the HV stimulator cables and plug them into the HV Stimulator ports on the front of the IXTA.
4. Connect the stimulator cables to the electrodes placed on the subject's **dominant** hand as shown.

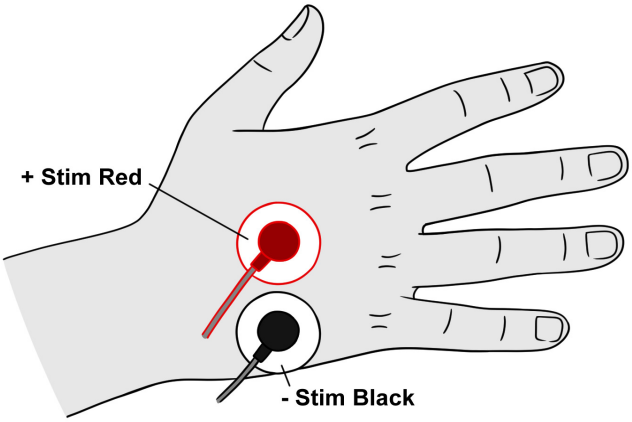

Figure HN-13-S3 and HN-13-S4: HV stimulator cables connected to the IXTA and connected to the hand. The black electrode is on the outside of the hand, the red electrode on the back of the hand.

Both the stimulating electrodes and the event marker will be using the subject's DOMINANT hand.

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Experiment HN-13: Conditioned Response

Exercise 1: Reaction Time and Green Color Signal

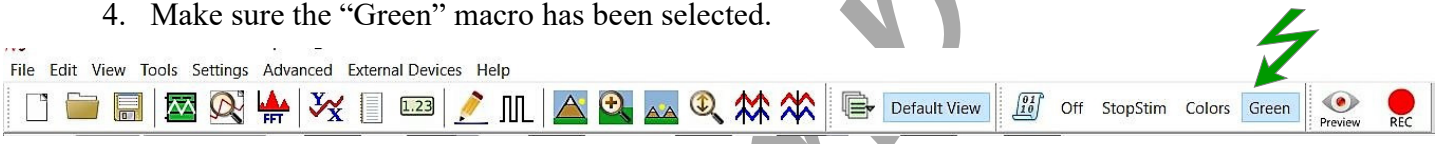
Aim: To measure the reaction time of a subject to a visual signal.

Approximate Time: 15 minutes

Exercise 1 will have no stimulation.

Procedure

1. Read all instructions carefully before beginning to record.
2. Information for the subject:
    - Instruct the subject to sit in a chair and face the computer screen.
    - Hold the event marker in the dominant hand.
    - Watch the left side of the computer screen and quickly press the event marker when the green image appears on the computer screen.
    - The green image will be shown 25 times at random intervals.
4. Make sure the “Green” macro has been selected.



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

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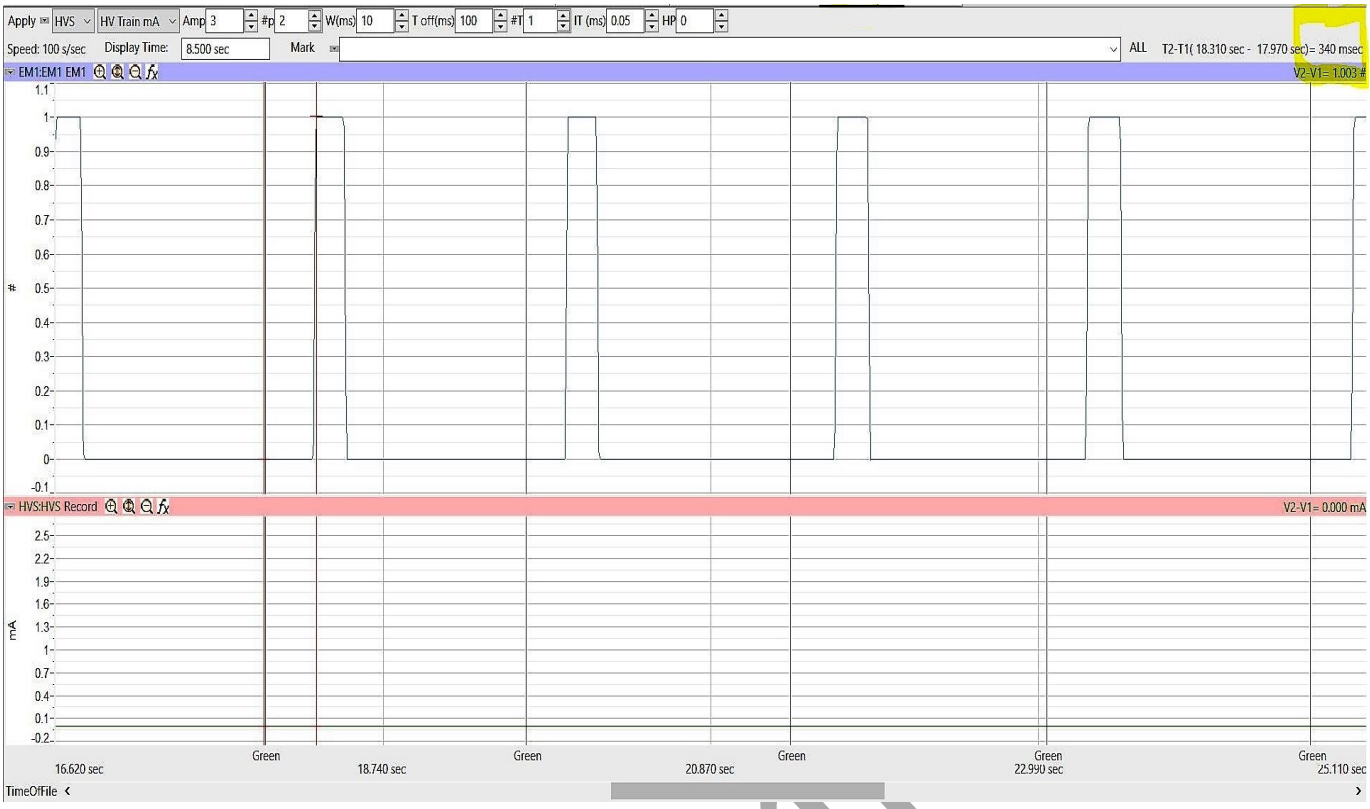

Figure HN-13-L2: Green images automatically marked each followed by the subject's response, are displayed on the Main window.

Data Analysis

1. Scroll to the beginning of the data recorded for Exercise 1 to display the trials on the Main window.
2. Use the Display Time icons to adjust the Display Time of the Main window to show both the visual signal made with the event marker and the mark made by the subject's response on the Main window. Double the display time to show at least 10 of the responses.

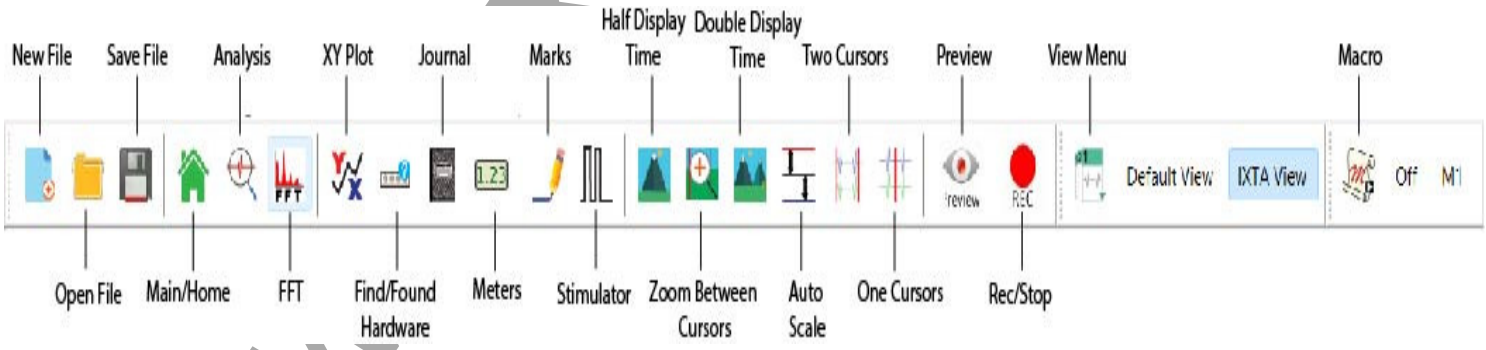

Figure HN-13-L2: The LabScribe toolbar.

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3. Data can be collected from the Main window or the Analysis window. If you choose to use the Analysis window, click on the Analysis window icon in the toolbar.
4. The mathematical functions, T2-T1 should appear on screen. The value T2-T1 is shown in the upper right of the Main window. In the Analysis window, click Add Function, General, T2-T1 if needed.
5. Use the mouse to click on and drag a cursor to the onset of the green signal. Drag the other cursor to the beginning of the mark made by the event marker.
6. Once the cursors are placed in the correct positions for determining the reaction time, record the value for T2-T1 on a separate data table.
7. Once the reaction time in the first trial is measured and recorded, repeat Steps 5 and 6 on the data from the second trial. Continue for the rest of the 24 trials.
8. Calculate the mean reaction time and enter into Table 1.

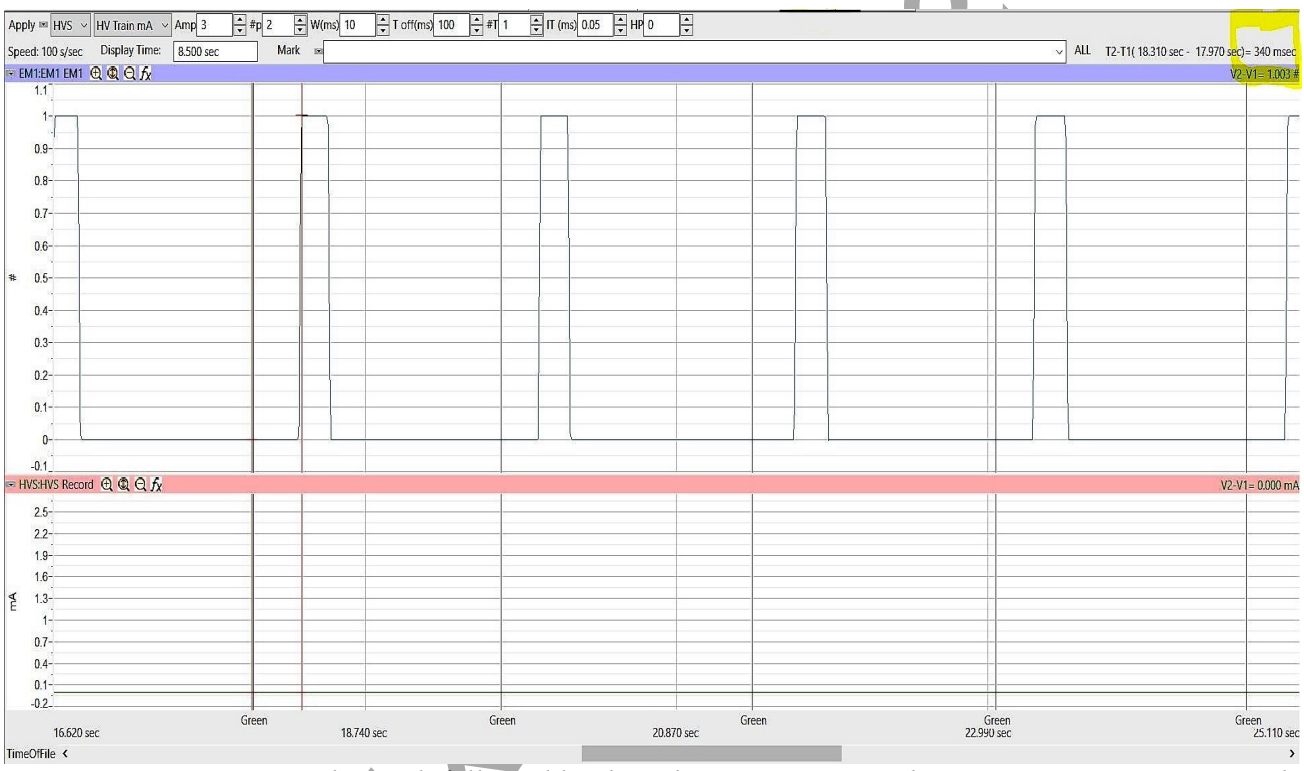

Figure HN-13-L4: A visual signal, followed by the subject's response. The two cursors are positioned at the beginning of the visual signal and on the mark for measurement of the subject's reaction time (T2-T1) in this trial = 340 msec.

Exercise 2: Reaction Time and Conditioned Response

Aim: To determine if the reaction time of a subject to an image can decrease if a small shock is applied to the hand.

Approximate Time: 15 minutes

WARNING - If the subject feels a painful stimuli, then the electrodes are in the wrong Place. Adjust the red electrode so that it is not on the tendons.

Work Lab

Procedure

1. Repeat the procedure from Exercise 1 making sure that the Colors macro is selected.

2. Instruct the subject that a green image will be shown on the screen but if the reaction time is not quick enough, a small shock will be applied to their non-dominant hand.
3. Instruct the subject to press the event marker as soon as they sees green image on the computer screen. The image will be shown 10 times at random intervals.
4. After the last response, click Stop to halt recording.
5. Select Save As in the File menu, type a name for the file. Click on the Save button to save the data file.

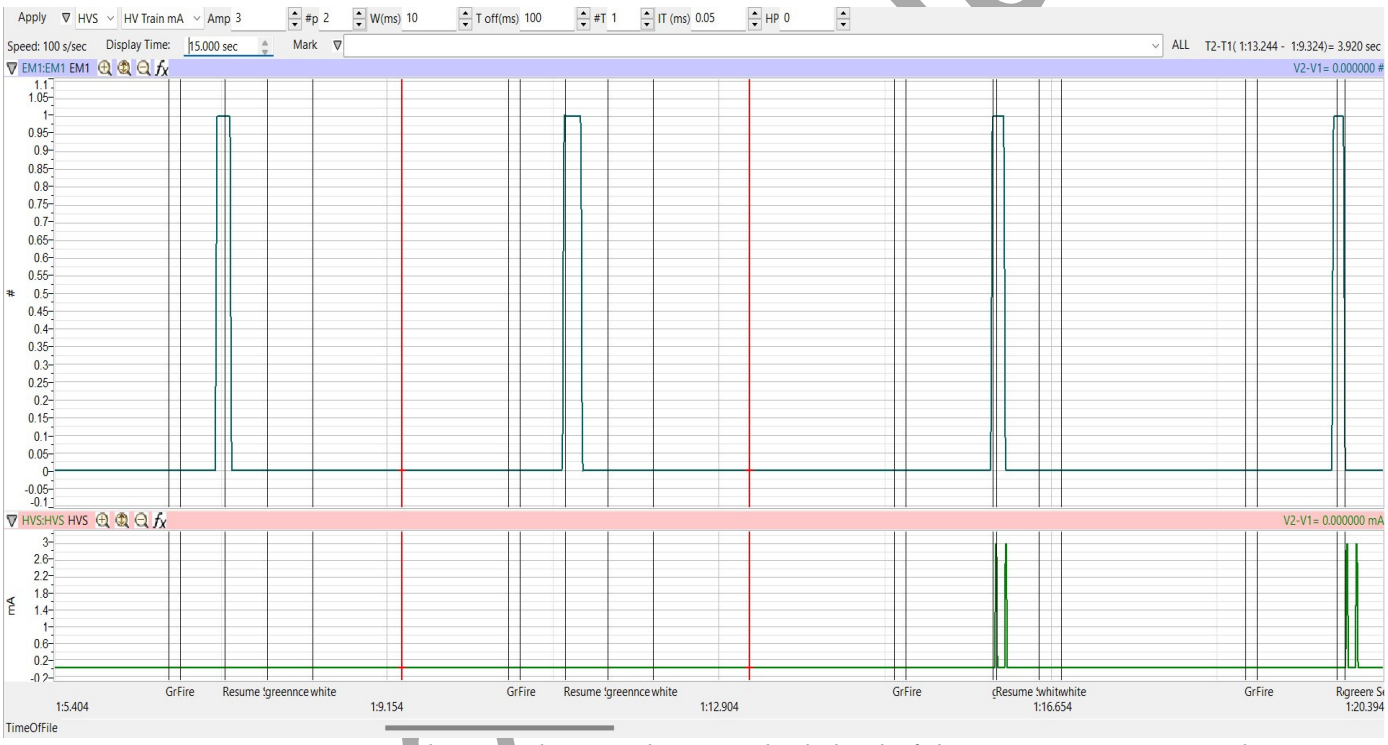

Figure HN-13-L5: Response showing the stimulator applied shock if the reaction time is too slow.

Data Analysis

1. Use the same technique explained in Exercise 1 to measure and record the reaction times of the subject presented with green images and shocks.
2. Enter the mean reaction time for this exercise in Table 1.

Work Le Lab

Questions Exercise 1 and 2

1. How does the subject's mean reaction time to just the green signals compare to his or her mean reaction time to green signals with stimulation?
2. What would cause a longer reaction time to one type of signal as compared to another?
3. How do your subject's mean reaction times compare to those of other subjects?
4. Do all subjects respond more quickly to the same signal?

Table HN-13-L1: Mean Reaction Times for Different Signals.

Signal	Mean Reaction Time of Your Subject (ms)	Mean Reaction Time of All Subjects (ms)	Shortest Mean Reaction Time in Class (ms)	Longest Mean Reaction Time in Class (ms)
Green Image				
Green Image with stimulation				

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