

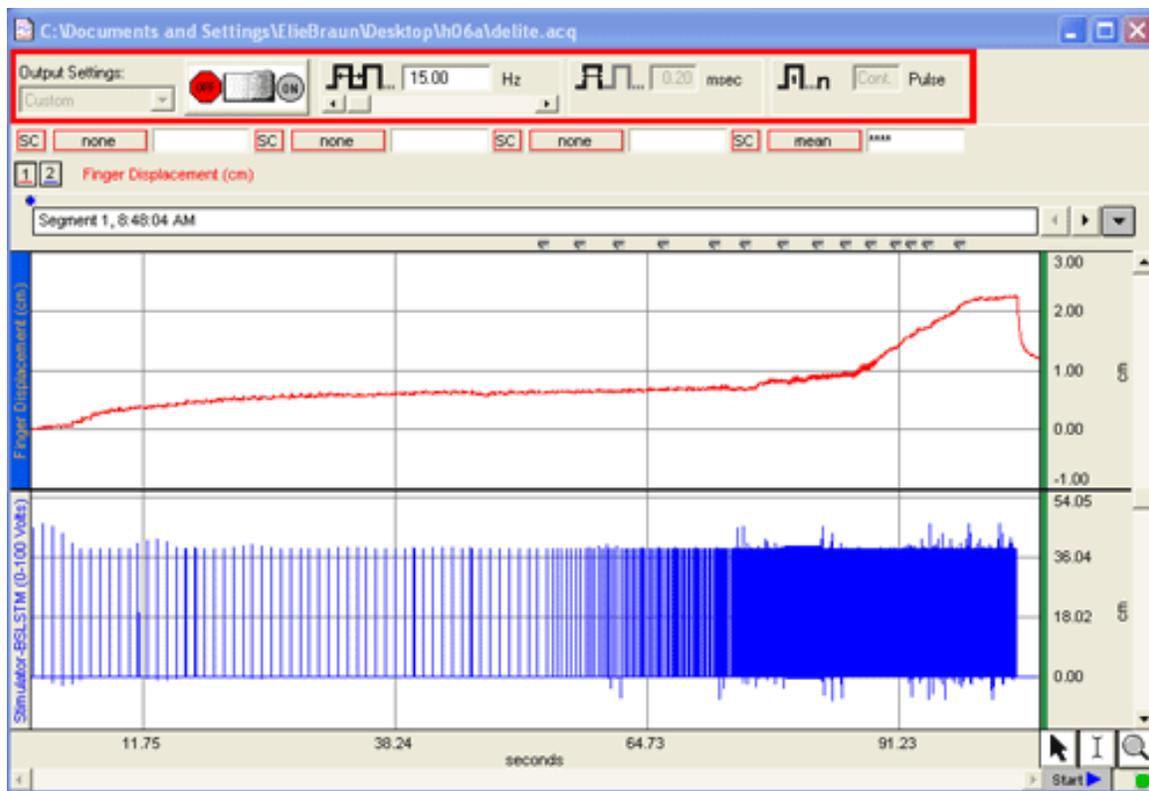


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BSL PRO Lesson H06

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Human Finger Twitch Experiment



This *PRO* lesson describes hardware and software setup of the BSL *PRO* System to record and measure the finger twitch from a human subject.

Objectives

1. To record the response generated from the twitch of a finger.
2. To measure the stimulus frequency required to induce fatigue.

Equipment

- PC running Windows or Macintosh computer
- BIOPAC Software: Biopac Student Lab *PRO* 3.7
- BIOPAC Data acquisition unit ([MP35](#) or MP30)
- BIOPAC Stimulator ([BSLSTMB](#) for MP35 or BSLSTMA for MP30)
- BIOPAC Finger Twitch Transducer ([SS61L](#))
 - If you don't have the SS61L, you can use the SS12LA Force Transducer. See [Finger Twitch using Force Transducer](#) for details.
- BIOPAC Human-safe Stimulating electrode ([HSTM01](#))

- Electrode gel ([GEL1](#))
- Adhesive tape ([TAPE1](#))

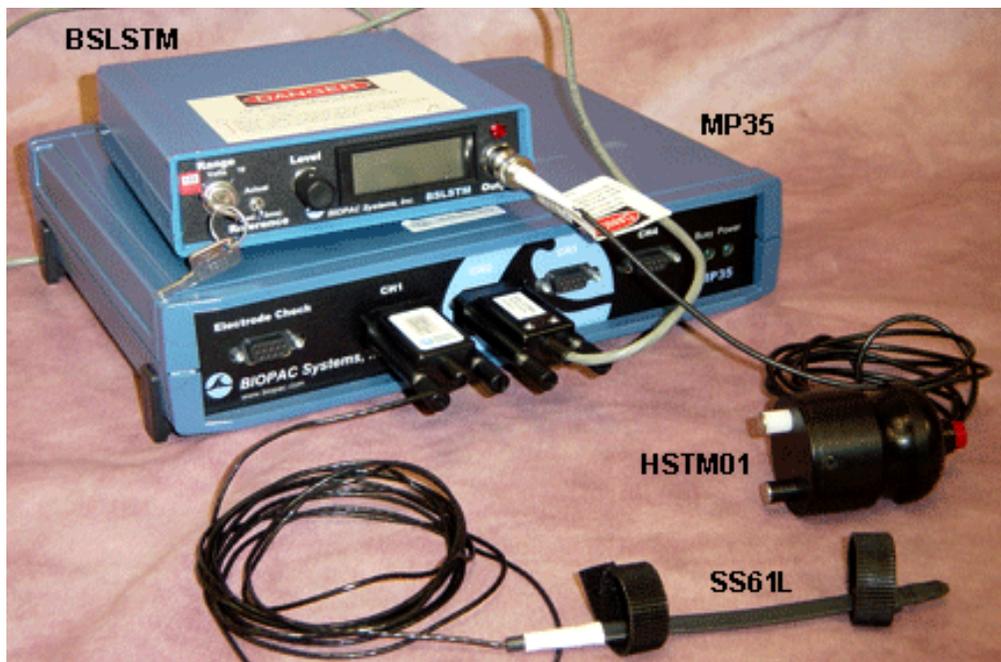
Setup

Hardware

1. Plug the **BSLSTM Trigger** cable into the **Analog Out** port on the back of the **MP3X** unit.



2. Plug the **BSLSTM Reference Output** connector into **CH 2** of the **MP3X** unit.
3. Plug the **SS61L Finger Twitch** transducer into **CH 1** on the **MP3X** unit
4. Plug the **HSTM01** human-safe stimulating electrode into the **Stimulus Output** port on the front of the **BSLSTM Stimulator**.
 - Be sure to position the small metal knob on the unit in the metal groove of the BNC connector and rotate clockwise to lock into place.

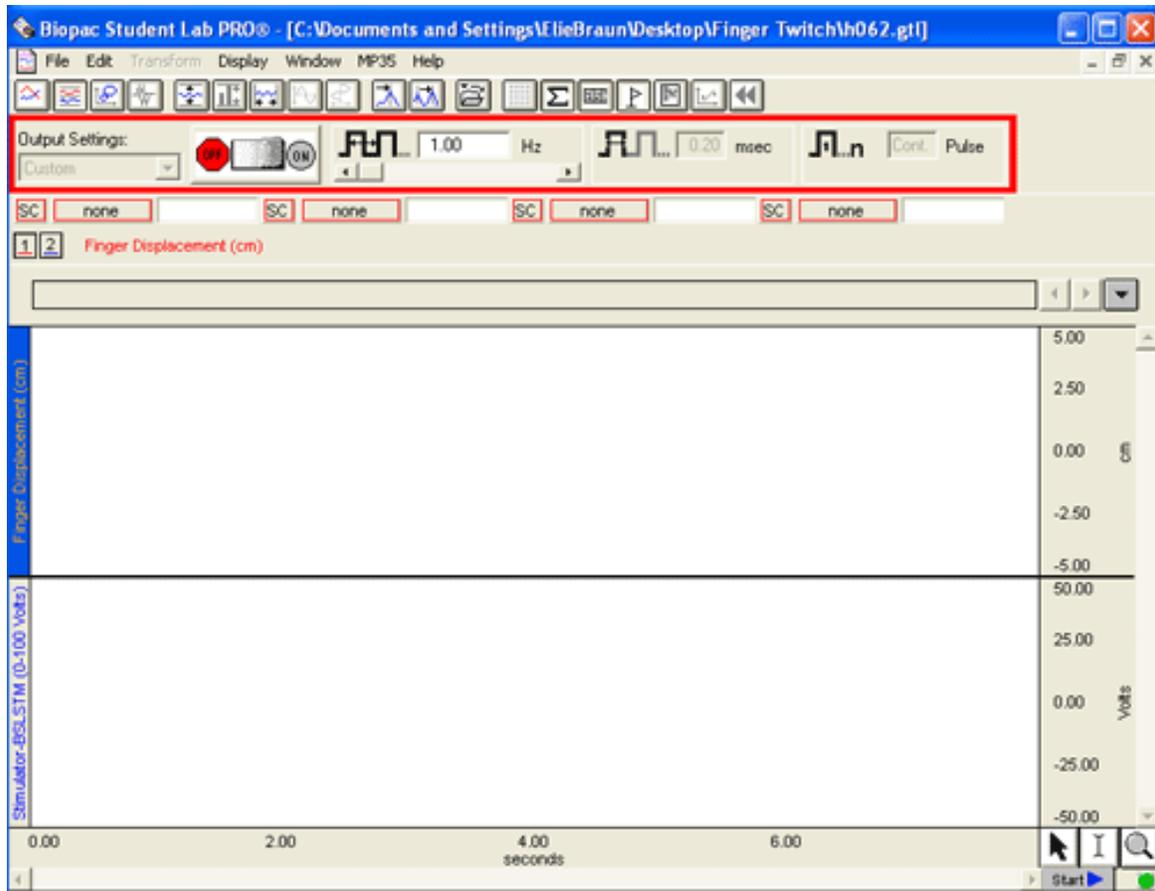


5. Set the voltage Level and Range.
 - On the **BSLSTMB**, turn the **Level** knob counterclockwise until it stops and turn the key to the left to set the **Range** at "100V."
6. Set the **Reference** switch to **Fixed (15ms)**.
7. Turn the **BSLSTM Stimulator on**.
8. Turn the **MP3X** data acquisition unit **on**.

Software

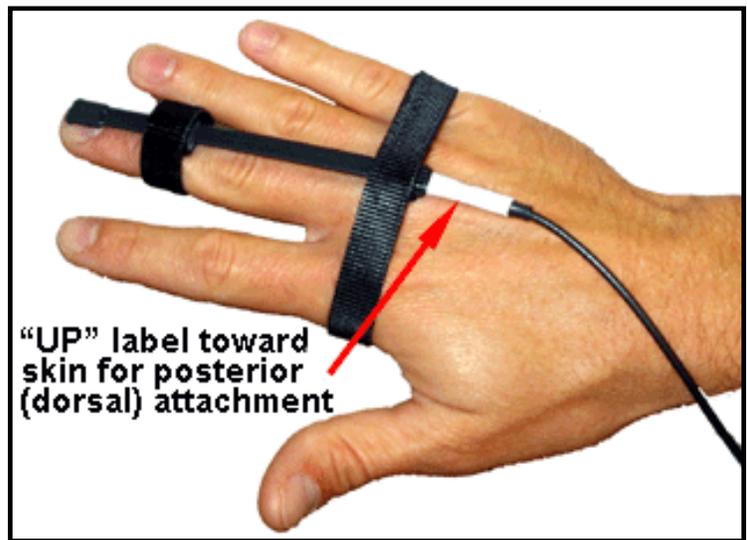
1. Turn the computer on.

2. Launch the **BSL PRO 3.7** software on the host computer.
 - The program should create a new "Untitled1" window.
3. Open the Finger Twitch template by choosing **File > Open > choose Files of type: GraphTemplate (*.GTL) > File Name: "[h06a.gtl](#)"**
 - A **Stimulator** window is automatically generated; do not close this window.



Subject Setup:

1. Attach the SS61L Finger twitch transducer to the subject.
 - Palmar placement is **recommended**.
 - If dorsal placement is required, make sure the "UP" label faces skin.



Calibration

SS61 Calibration

1. Select **MP35 > Setup Channels** then click the Channel 1 wrench icon and choose "Scaling."
2. Make sure the finger is pointing straight (best against a table) and click 'Cal1'. This will be equivalent to 0 cm.
3. Have the subject bend his or her finger 5cm from the table and click 'Cal2'. This will be equivalent to 5 cm.
4. Click OK.

	Input value	Scale value
Cal1	2867 microV	0
Cal2	3149 microV	5

Units label: cm

Buttons: Cancel, OK

HSTM01 prep

1. Have the subject rest his or her arm, palm up, on a flat surface and smear some electrode gel on the lower forearm.
2. Place the HSTM01 stimulating probe lengthwise along the wrist and have the Subject depress the red button to

allow stimulation.



3. Confirm that "Pulse Rate" is set to 1.00 Hz in the Stimulator window and then click on the "ON" switch.
4. Slowly increase the Level setting on the BSLSTM Stimulator until an involuntary twitch is noted on one of the three middle fingers.
 - o A response usually occurs between 20 and 40 volts.
 - o If you do not see any twitching, set the Level on the stimulator at 40 volts and slowly move the stimulating probe around the forearm while maintaining a lengthwise orientation.
5. After locating a point on the forearm that generates a distinct twitch from one of the three middle fingers, find a comfortable voltage setting for the subject.
6. Click the "OFF" switch in the **Stimulator** window without adjusting the Level setting on the BSLSTM Stimulator.
7. Attach the SS61L Finger Twitch Transducer to the index finger.

Running the Experiments:

Note

This recording is set up for the Append mode, so when the acquisition is stopped then re-started, data will be added onto the previous data. A marker will automatically be inserted with a time stamp to indicate the new segment start time.

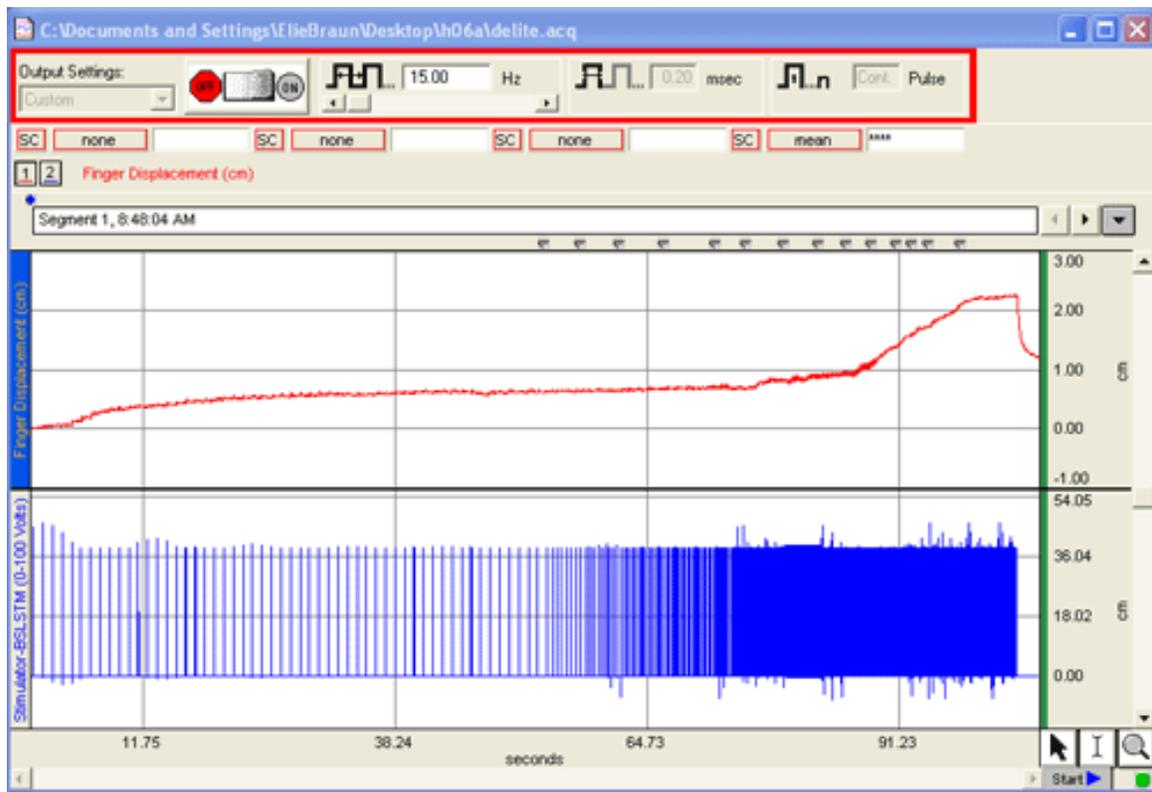
To save recorded data, choose File menu > Save As... > file type: BSL PRO files (*.ACQ) File name: (Enter Name) > Save button

To erase all recorded data (make sure you have saved it first), and begin from Time 0, choose:

MP35 menu > Setup Acquisition > Click on "Reset" button

1. Keep the HSTM01 stimulating probe in the same place on the forearm where the twitch was detected.
2. Press the "Start" button on the data window.
3. Have the subject close his eyes and relax with his hand resting on a table or other surface.
4. Click the "ON" switch in the **Stimulator** window.
5. Have the subject depress the red button on the HSTM01 to allow stimulation.
6. Increase the stimulation frequency in the **Stimulator** window in 1 Hz increments until the Force data plateaus.
7. Click the "OFF" switch in the **Stimulator** window.

The data should resemble the following screen shot.



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