

SPME 430
Kistler BioWare
Force Plate Data Collection & Analysis

1. Start the Force Plate Computer
2. Login in as username _____ with password _____.
3. Double click the BioWare icon on the desktop to start the program.

Charge Amplifiers

1. On the larger, blue 8 Channel Charge Amplifier, make certain that the Bottom switch is on the Remote Setting.
2. On the smaller Control Unit, make certain that the light next to the Remote button is lit.

Subject Weight

1. *Data > Acquire Trial*
2. *Weight*
3. Have the subject stand on force plate #1 (dark gray plate) when the Measure Body Weight window appears.
4. Press *OK* when the weight/force readings have stabilized.
5. *Cancel*

Data Collection

1. *Data > Acquire Trial*
2. *Start*
3. When you are ready to begin recording force data and with the subject NOT standing on either force plate, press *OK*.
4. Have the subject perform the movement skill
5. Data collection will cease after a predetermined period of time.
6. Graph displaying the force values will be displayed.

Saving Force Data Files

1. *File > Save (CTRL-S)*
2. Use the File Save As window tools to navigate to the correct folder to save the data, for this lab the correct folder is C:\SPME430_2006\
3. Enter a filename (do not enter an extension for the file)
4. *Save*
5. I suggest that you close the window displaying the force data after the file is saved and analysis is completed. To close the window, click the Orange X in the upper-right corner of the force display window.

Zoom/Magnify the display

1. While holding the right mouse button down, click and drag an area on the graph display.
2. The graph will Zoom/Magnify the selected area
3. Press F2 to return to the original view.

Data Analysis - Statistics

1. *View > Statistics* (F3)
2. Use the mouse to drag the green line horizontally across the force data display until it is positioned at the **START** of the period of interest/analysis. Or you may enter a time value in the Start window.
3. Use the mouse to drag the red line horizontally across the force data display until it is positioned at the **END** of the period of interest/analysis. Or you may enter a time value in the End window.
4. *Update*
5. Record the values of interest from the Statistics window.
6. Click *Done* when completed.

Data Analysis - Moving Cursor

1. *View > Moving Cursor* (F4)
2. Use the mouse to drag the green line horizontally across the force data display and observe the values for the force(s) and time in the Cursor Position window.
3. Click *Close* when completed.

Change Graph Display

1. Click the graph icon in the toolbar (8th button)
2. Change the graph as desired. The Graph Setup window is self-explanatory.
3. Click *OK* when completed.

Exit BioWare

1. *File > Exit*

Lab Assignment - Part A

1. Using a chair, have a subject drop from the chair and land on the force plates. The right foot should be on plate #1 and the left foot on plate #2 during the jump.
2. Using only the vertical GRF force data collected, determine the following values.
3. For the right leg:

Impact Force Peak	
Active Force Peak	
Time Impact Force Peak occurred	
Time Active Force Peak occurred	
Loading Rate from TD to Impact Force Peak	
Vertical force 100msec after TD	

4. For the left leg:

Impact Force Peak	
Active Force Peak	
Time Impact Force Peak occurred	
Time Active Force Peak occurred	
Loading Rate from TD to Impact Force Peak	
Vertical force 100msec after TD	

Lab Assignment - Part B

1. Conduct a maximum effort vertical jump from the force plates. The right foot should be on plate #1 and the left foot on plate #2 during the jump.
2. Use the force data to compute the height of a vertical jump.
 - A. Determine the weight of the subject _____ N.
 - B. Determine the instant of first movement of the jumper _____ s.
 - C. Determine the instant of takeoff _____ s.
 - D. Determine the duration of the takeoff phase of the jump (C-B) _____ s.
 - E. Compute the vertical impulse due to the weight of the jumper ($D \cdot A \cdot -1$) _____ Ns.
 - F. Compute the vertical impulse due to the vertical component of the ground reaction force _____ Ns.
 - G. Compute the net vertical impulse (F+E) _____ Ns
 - H. Compute the mass of the subject ($A/9.81$) _____ kg
 - I. What was the vertical velocity of the subject at the instant of first movement _____ m/s.
 - J. What is the change in vertical velocity of the jumper over the duration of the takeoff phase (G/H) _____ m/s.
 - K. What is the vertical velocity of the jumper at takeoff _____ m/s
 - L. What was the change in displacement of the CM of the jumper between takeoff and the peak height of the CM during the airborne phase of the jump? _____ m

* *indicates multiplication*