med associates inc

instrumentation and software for research

TRIVECTOR

SOF-530 User's Manual
DOC-018
Rev. 1.2

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CHAPTER 1
Installation

Installing the TriVector Software

Insert the TriVector CD into the CD-ROM drive. The CD should run automatically and start the installation program. If the installation program does not start, then go to Start | Run and Browse to the SETUP.EXE program on the TriVector CD and click on the button that says OK.

Figure 1.1 – Start the TriVector Installation Program

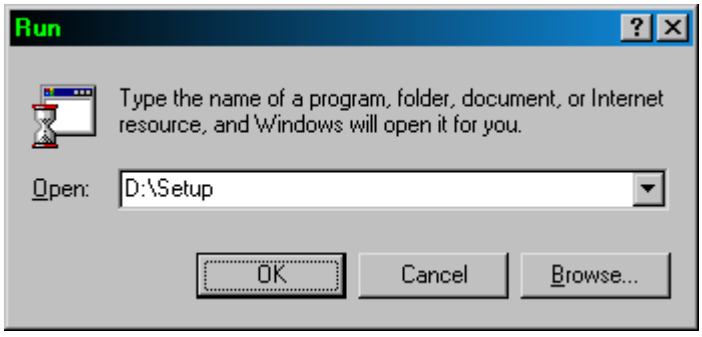
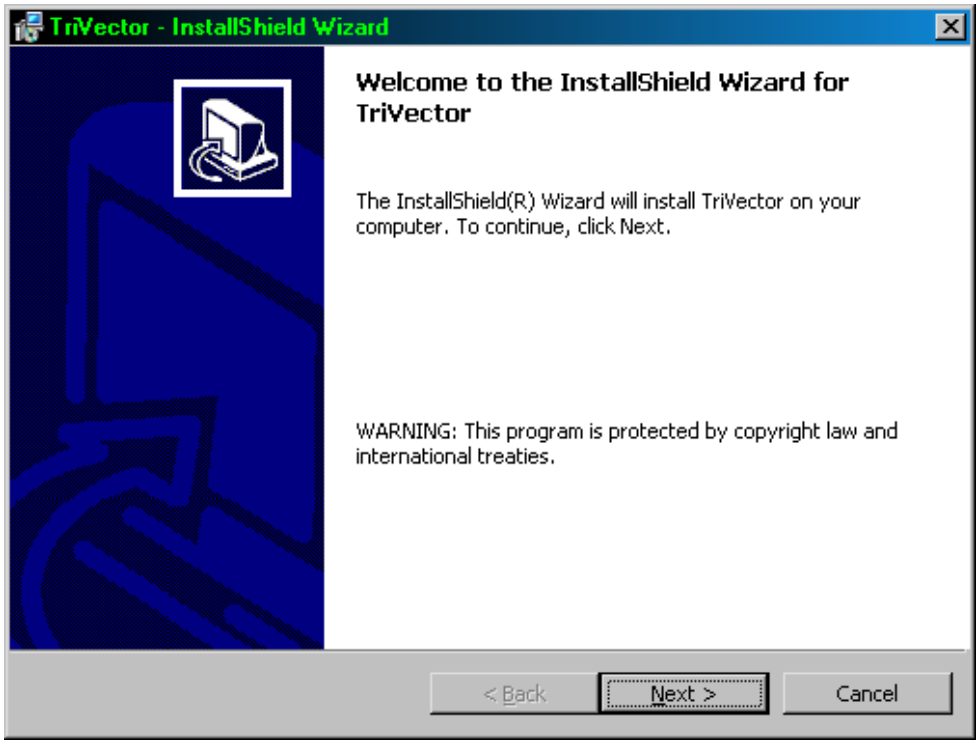
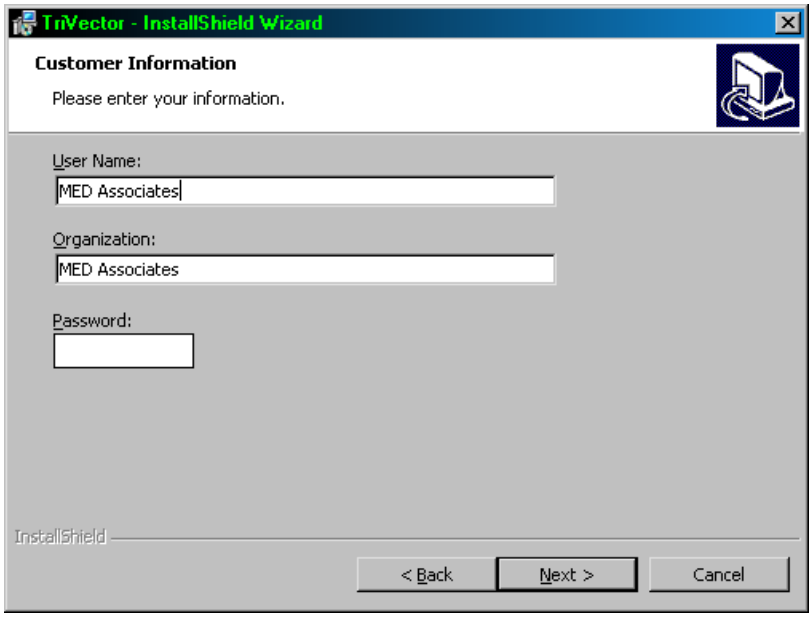


Figure 1.2 – InstallShield Wizard for TriVector



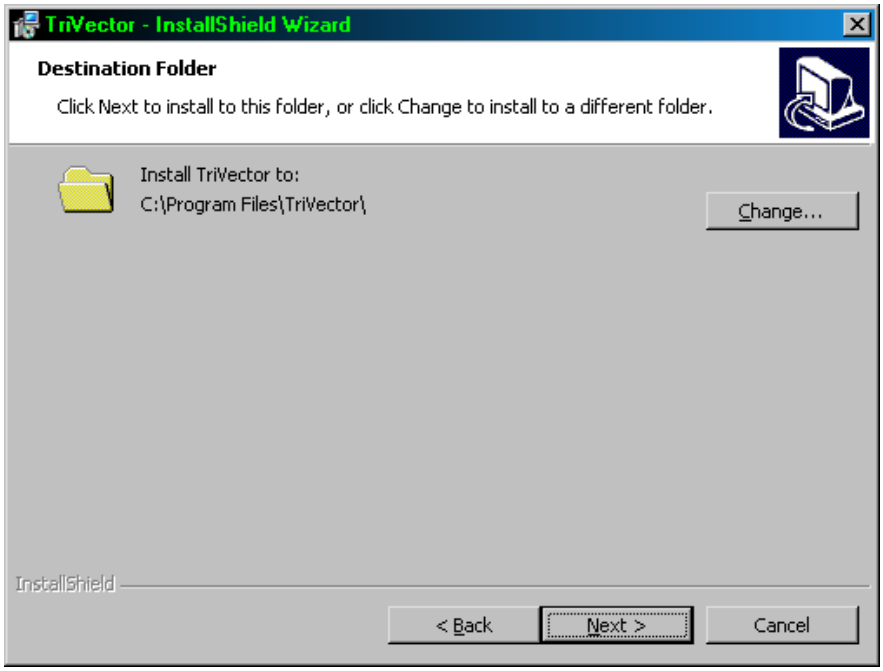
When the screen shown in Figure 1.2 appears, select the “Next” button.

Figure 1.3 – Enter Password



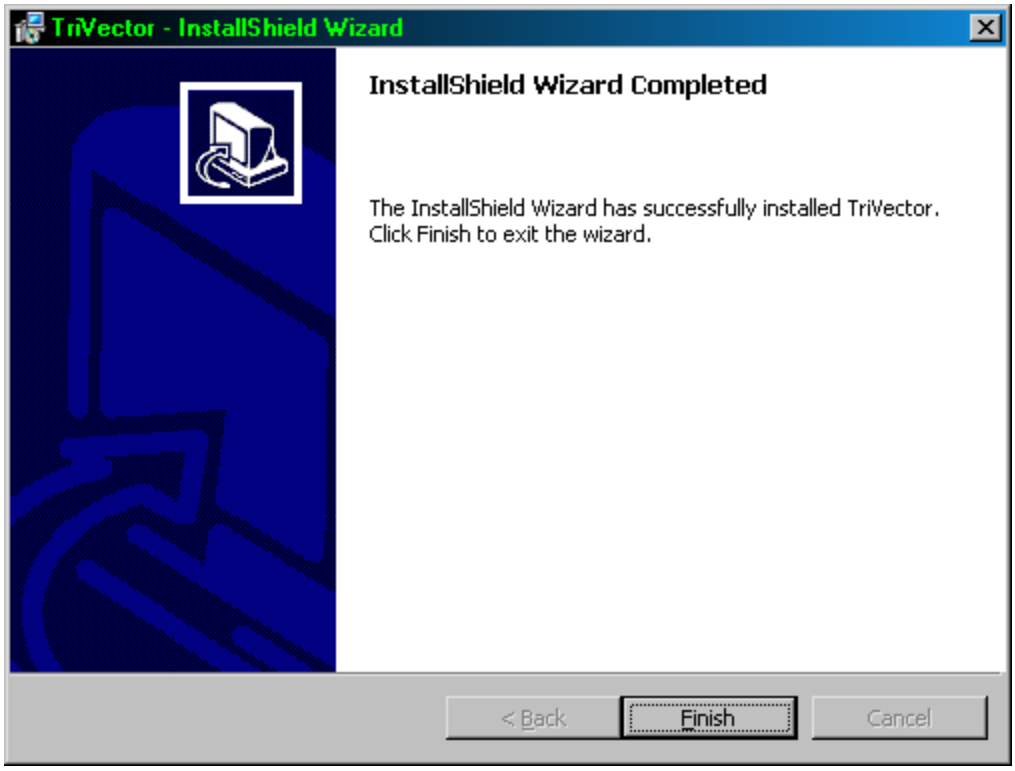
When the screen shown in Figure 1.3 appears, enter your password and select the “Next” button.

Figure 1.4 – Destination Folder



When the screen shown in Figure 1.4 appears, select the “Next” button.

Figure 1.5 – Installation Complete



When the screen shown in Figure 1.5 appears, click on the “Finish” button. Your TriVector software has now been installed.

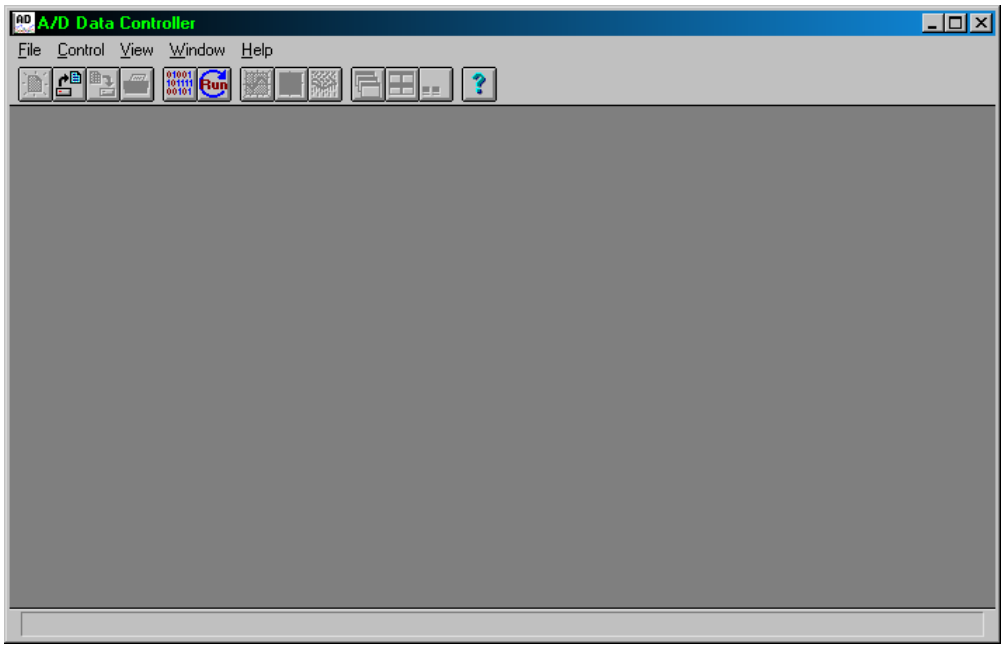
Connecting the Hardware

1. Connect the 9-pin Serial Cable from the COM Port on the Computer to the 9-pin connector on the TriVector box.
2. Connect the Headphones to the port labeled Audio.
3. Connect the Goggles to the port labeled Flash.
4. Connect the Power Cord to the back of the TriVector box and plug the other end into a wall AC outlet.

CHAPTER 2
Running the Software

The TriVector Main Menu

Figure 2.1 – The TriVector Main Menu



The TriVector main menu provides five sets of submenus. The main menu options are:

Option	Description
File	Create New experiments; Open, Save, and Print existing experiments and configurations; Exit from the program.
Control	Set options for your data collection and start collecting data.
View	View New Graphs, Data Reports, or Summaries Reports; set parameters for your graphs.
Window	Cascade, Tile, and switch between varying windows.
Help	Get Help about the program and information about the program version.

File Menu options

New

The New command closes the current experiment.

Open

The Open command opens a saved experiment.

Save As

The Save As command saves the current experiment to a file.

Print

The Print command prints the graph that is currently selected to the printer.

Exit

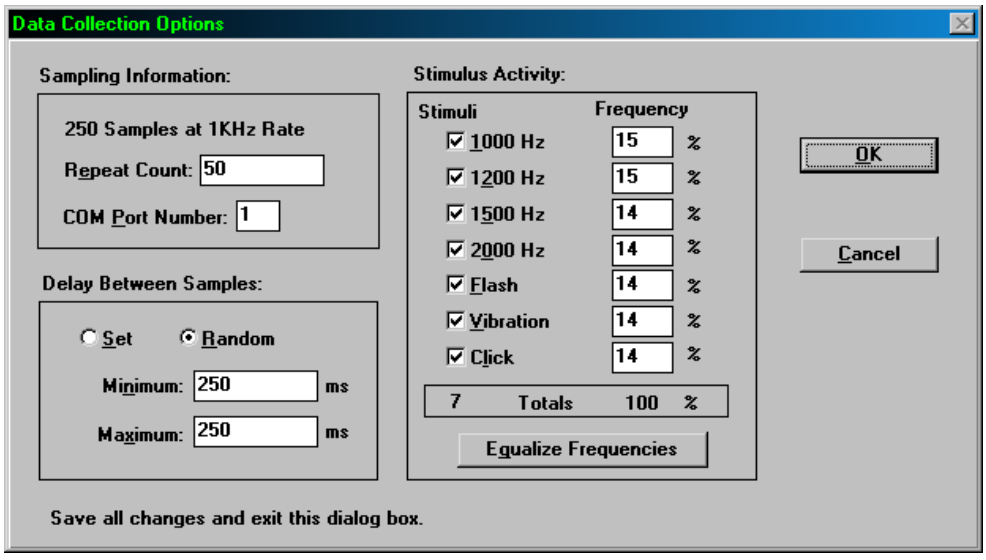
The Exit command exits the program.

Control Menu Options

Data Options

The Data Options command allows you to change which stimulus will be sent, how many times each stimulus is sent, and the delay between each stimulus.

Figure 2.2 – Data Collection Options



Option	Description
Repeat Count	The total number of Stimuli to Send. The valid range is from 1 to 1000.
COM Port Number	The Serial or COM Port that the TriVector hardware is connected to. The valid range is from 1 to 99.
Set	A fixed delay time is used between each measurement.
Random	A random delay time is used between each measurement.
Interval / Minimum	If Set is chosen, then this is the fixed amount of time that will be used between each stimulus. If Random is chosen, then this is the minimum amount of time that will be used between each stimulus. The valid range is from 20 to 2250.
Maximum	If the Random option is chosen, then this is the maximum amount of time that will be used between each stimulus. The valid range is from 21 to 2250.
1000 Hz	Enables or disables the 1000 Hz tone stimulus.
1200 Hz	Enables or disables the 1200 Hz tone stimulus.
1500 Hz	Enables or disables the 1500 Hz tone stimulus.
2000 Hz	Enables or disables the 2000 Hz tone stimulus.
Flash	Enables or disables the visual Flash stimulus.
Vibration	Enables or disables the physical Vibration stimulus.
Click	Enables or disables the audio Click stimulus.
Frequency	This is the percentage that this stimulus will be chosen for the next stimuli. Example: If the 1000 Hz and 1200 Hz stimuli are both chosen and set to 50% each, then there is a 50% chance that the 1000 Hz stimuli will be chosen as the next stimulus to be presented to the subject. It does not mean that the 1000 Hz stimuli will be played 50% of the time.
Equalize Frequencies	Sets the frequency of all the chosen stimuli's to an equal number.
OK	Save all changes and exit the window.
Cancel	Discard all changes and exit the window.

Start Collection

The Start Collection command runs the experiment and collects the data.

View Menu Options

New Graph

The New Graph command opens a new window of the last graph type that was requested.

New Scalar Set

The New Scalar Set command opens a set of graphs showing

'X, Y, Z, and |V| (magnitude) vs. Time' plots for each stimulus.

New Trajectory Set

The New Trajectory Set command opens a set of graphs showing 'Y and Z vs. X' plots for each stimulus.

New Detail Set

The New Detail Set command opens a set of graphs showing:

Y and Z vs. X
X and Z vs. Y
X and Y vs. Z
X, Y, Z, and |V| vs. Time

plots for the stimulus type that was selected.

New Summary Report

The New Summary Report command opens a window that shows a summary report of the different stimuli that were used in the experiment.

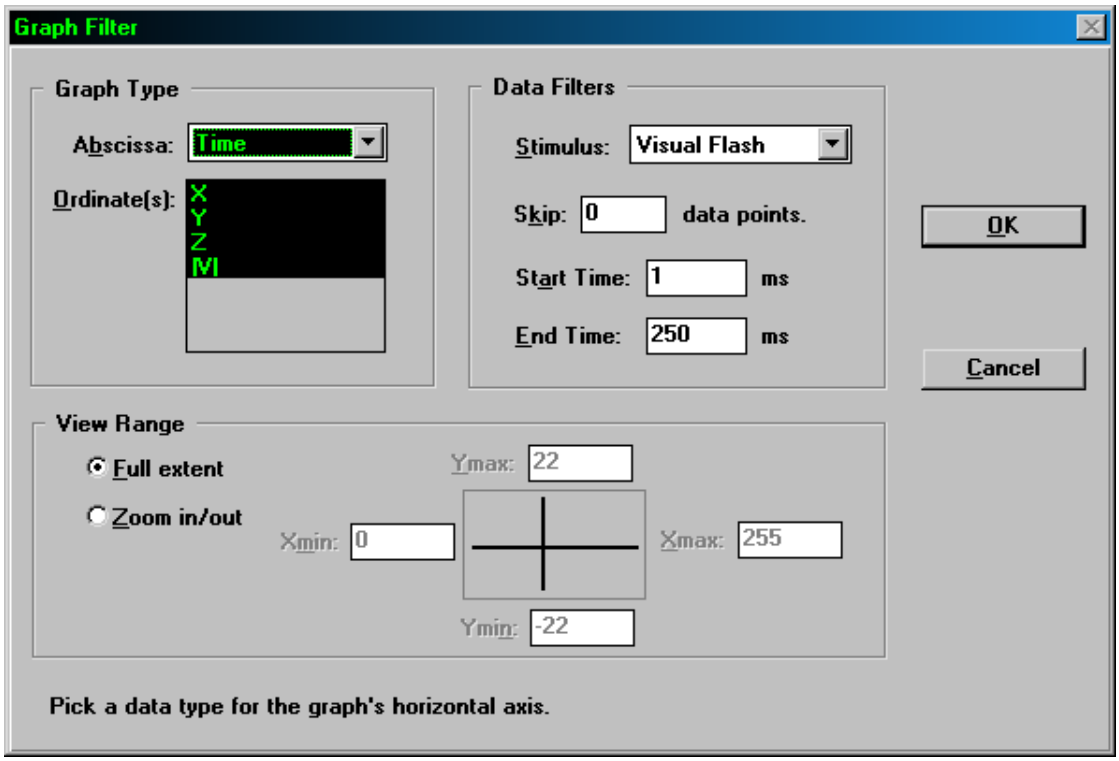
New Data Report

The New Data Report command opens a window that shows the raw data that was recorded for each stimulus that was used in the experiment.

Graph Filter

The Graph Filter command allows you to change how the data appears in the selected graph window.

Figure 2.3 – Graph Filter Options



Option	Description
Abscissa	Selects which data type will be plotted on the X-Axis. Valid values are X, Y, Z, |V| (magnitude), and Time.
Ordinate(s)	Selects which data type(s) will be plotted on the Y-Axis. Valid values are X, Y, Z, and |V|.
Stimulus	Selects which graph type to display. Valid values are Audio(1000 Hz), Audio(1200 Hz), Audio(1500 Hz), Audio(2000 Hz), Visual Flash, Physical Vibration, and Audio Click.
Skip	The number of data points that will be skipped. Zero means that all data points will be displayed. Valid values are 0 – 20.
Start Time	The time that you want the data to start at. Valid values are 0 – 240.
End Time	The time that you want the data to stop at. Valid values are 10 – 250.
Full Extent	If Full Extent is chosen, then the default zoom settings of 0 to 255 on the X-Axis and -10 to 10 on the Y-Axis will be used.
Zoom In/Out	If Zoom In/Out is chosen, then you can specify your own zoom settings for the X and Y Axis's.
Xmin	This is the lower limit for the graph's horizontal axis (Abscissa). This option will be grayed out if the Time option is selected for the Abscissa.
Xmax	This is the upper limit for the graph's horizontal axis (Abscissa). This option will be grayed out if the Time option is selected for the Abscissa.
Ymin	This is the lower limit for the graph's vertical axis (Ordinate).
Ymax	This is the upper limit for the graph's vertical axis (Ordinate).
OK	Save all changes and exit the window.
Cancel	Discard all changes and exit the window.

Window Menu Options

Cascade

Displays all open windows in a cascade type format. Note: Make sure all the windows you want to display are open. Closed or minimized windows will not be cascaded.

Tile

Displays all open windows in a tile type format. Note: Make sure all the windows you want to display are open. Closed or minimized windows will not be tiled.

Arrange Icons

Arranges all minimized windows along the bottom

Close All

Closes all open windows including windows that have been minimized.

Help Menu Options

Contents

Opens the on-line help manual.

About

Displays the About window with information about the product version and the programs copyright information.

Figure 2.4 – About Window

CHAPTER 3
Data File Formats

The Raw Data File

The raw data file has a .DAT extension and holds all of the measurements that were recorded. This is also the file that should be selected when it is desired to go back and reanalyze the data.

```
1000                -- Total number of stimuli that was sent (Repeat Count)
250                    -- Each Stimulus will provide '250 Samples at 1KHz
Rate'
20                      -- Minimum amount of delay that was used between
samples
2250                    -- Maximum amount of delay that was used between
samples
7                    -- Number of different stimuli that are saved in this
file

0                                 -- Stimulus Type (0 = 1000Hz)
146                               -- # of 1000Hz Stimuli that was presented
1                                 -- All measurements are averaged together
250                               -- There are 250 samples
   -0.358645,    -0.334376,    -0.469205  -- 1st measurement
   -0.382914,    -0.326286,    -0.466508  -- 2nd measurement
                       .
                       .
                       .
   -0.407184,    -0.353252,    -0.493474  -- 249th measurement
   -0.407184,    -0.350555,    -0.488081  -- 250th measurement

1                                 -- Stimulus Type (1 = 1200Hz)
173                               -- # of 1200Hz Stimuli that was presented
1                                 -- All measurements are averaged together
250                               -- There are 250 samples
   -0.389149,    -0.339083,    -0.473351  -- 1st measurement
   -0.357289,    -0.332256,    -0.459697  -- 2nd measurement
                       .
                       .
                       .
   -0.384598,    -0.332256,    -0.475627  -- 249th measurement
    -0.42101,    -0.357289,    -0.489281  -- 250th measurement

2                                 -- Stimulus Type (2 = 1500Hz)
123                               -- # of 1500Hz Stimuli that was presented
1                                 -- All measurements are averaged together
250                               -- There are 250 samples
   -0.412906,    -0.358492,    -0.480123  -- 1st measurement
   -0.384098,    -0.339287,    -0.457717  -- 2nd measurement
                       .
                       .
                       .
   -0.400102,    -0.332885,    -0.489725  -- 249th measurement
   -0.393701,    -0.348889,     -0.46732  -- 250th measurement
```

```
3                                 -- Stimulus Type (3 = 2000Hz)
151                               -- # of 2000Hz Stimuli that was presented
1                                 -- All measurements are averaged together
250                               -- There are 250 samples
   -0.406737,    -0.331126,    -0.479741  -- 1st measurement
   -0.422381,     -0.33634,    -0.484956  -- 2nd measurement
                       .
                       .
                       .
   -0.440632,    -0.357199,    -0.482349  -- 249th measurement
   -0.391093,    -0.344162,    -0.469312  -- 250th measurement

4                                 -- Stimulus Type (4 = Flash)
141                               -- # of Flash Stimuli that was presented
1                                 -- All measurements are averaged together
250                               -- There are 250 samples
    -0.40487,    -0.340649,    -0.485844  -- 1st measurement
   -0.435584,    -0.362987,    -0.483051  -- 2nd measurement
                       .
                       .
                       .
   -0.399285,    -0.346233,    -0.477467  -- 249th measurement
   -0.388116,    -0.326688,    -0.455129  -- 250th measurement

5                                 -- Stimulus Type (5 = Vibration)
129                                     -- # of Vibration Stimuli that was
presented
1                                 -- All measurements are averaged together
250                               -- There are 250 samples
   -0.415064,    -0.366233,    -0.469999  -- 1st measurement
   -0.390649,     -0.34487,    -0.469999  -- 2nd measurement
                       .
                       .
                       .
   -0.378441,    -0.332662,    -0.473051  -- 249th measurement
   -0.384545,    -0.366233,     -0.45474  -- 250th measurement

6                                 -- Stimulus Type (6 = Click)
137                               -- # of Click Stimuli that was presented
1                                 -- All measurements are averaged together
250                               -- There are 250 samples
   -0.405196,      -0.3391,    -0.468418  -- 1st measurement
   -0.410943,    -0.336226,    -0.479913  -- 2nd measurement
                       .
                       .
                       .
    -0.38508,    -0.333352,    -0.451175  -- 249th measurement
   -0.376458,    -0.330479,    -0.479913  -- 250th measurement
15                  -- Frequency that was used to select the 1000Hz Stimuli
15                  -- Frequency that was used to select the 1200Hz Stimuli
14                  -- Frequency that was used to select the 1500Hz Stimuli
14                  -- Frequency that was used to select the 2000Hz Stimuli
14                  -- Frequency that was used to select the Flash Stimuli
14                      -- Frequency that was used to select the Vibration
Stimuli
14                  -- Frequency that was used to select the Click Stimuli
```

The Summary Report

The summary report displays a summary of the different stimuli that were used in the experiment.

```
Sample Count = 1000
Sample Period = 250 ms
Random Delay = [20 - 2250 ms]
Number of Different Stimuli = 7

Stimulus #1: (Frequency of occurrence =15%)
Stimulus Type: Audio(1000 Hz)
   Averaged data from 146 samples.
   Minimum values: (   -0.439543,    -0.366735,    -0.509654)
   Maximum values: (   -0.347859,    -0.153705,    -0.369432)

Stimulus #2: (Frequency of occurrence =15%)
Stimulus Type: Audio(1200 Hz)
   Averaged data from 173 samples.
   Minimum values: (   -0.432388,    -0.370944,     -0.50066)
   Maximum values: (   -0.352738,    -0.188885,    -0.311775)

Stimulus #3: (Frequency of occurrence =14%)
Stimulus Type: Audio(1500 Hz)
   Averaged data from 123 samples.
   Minimum values: (   -0.425709,    -0.374496,    -0.505729)
   Maximum values: (   -0.368094,    -0.124832,    -0.377697)

Stimulus #4: (Frequency of occurrence =14%)
Stimulus Type: Audio(2000 Hz)
   Averaged data from 151 samples.
   Minimum values: (   -0.445847,    -0.383272,      -0.5006)
   Maximum values: (   -0.344162,   -0.0677895,    -0.385879)

Stimulus #5: (Frequency of occurrence =14%)
Stimulus Type: Visual Flash
   Averaged data from 141 samples.
   Minimum values: (   -0.435584,    -0.371363,    -0.499805)
   Maximum values: (    -0.35461,    -0.142402,    -0.201039)

Stimulus #6: (Frequency of occurrence =14%)
Stimulus Type: Physical Vibration
   Averaged data from 129 samples.
   Minimum values: (   -0.421168,    -0.369285,    -0.512727)
   Maximum values: (   -0.360129,   -0.0335714,     -0.21974)

Stimulus #7: (Frequency of occurrence =14%)
Stimulus Type: Audio Click
   Averaged data from 137 samples.
   Minimum values: (   -0.433933,    -0.370711,    -0.500029)
   Maximum values: (   -0.353469,    -0.126444,    -0.247141)
```

The Data Report

The data report displays all of the data that is in the raw data file, but in a format that is much easier to read.

```
Sample Count = 1000
Sample Period = 250 ms
Random Delay = [20 - 2250 ms]
Number of Different Stimuli = 7

Stimulus #1: (Frequency of occurrence =15%)
Stimulus Type: Audio(1000 Hz)
   Averaged data from 146 samples.
     1: (   -0.358645,    -0.334376,    -0.469205)
     2: (   -0.382914,    -0.326286,    -0.466508)
                              .
                              .
                              .
   249: (   -0.407184,    -0.353252,    -0.493474)
   250: (   -0.407184,    -0.350555,    -0.488081)

Stimulus #2: (Frequency of occurrence =15%)
Stimulus Type: Audio(1200 Hz)
   Averaged data from 173 samples.
     1: (   -0.389149,    -0.339083,    -0.473351)
     2: (   -0.357289,    -0.332256,    -0.459697)
                              .
                              .
                              .
   249: (   -0.384598,    -0.332256,    -0.475627)
   250: (    -0.42101,    -0.357289,    -0.489281)

Stimulus #3: (Frequency of occurrence =14%)
Stimulus Type: Audio(1500 Hz)
   Averaged data from 123 samples.
     1: (   -0.412906,    -0.358492,    -0.480123)
     2: (   -0.384098,    -0.339287,    -0.457717)
                              .
                              .
                              .
   249: (   -0.400102,    -0.332885,    -0.489725)
   250: (   -0.393701,    -0.348889,     -0.46732)

Stimulus #4: (Frequency of occurrence =14%)
Stimulus Type: Audio(2000 Hz)
   Averaged data from 151 samples.
     1: (   -0.406737,    -0.331126,    -0.479741)
     2: (   -0.422381,     -0.33634,    -0.484956)
                              .
                              .
                              .
   249: (   -0.440632,    -0.357199,    -0.482349)
   250: (   -0.391093,    -0.344162,    -0.469312)
```

```
Stimulus #5: (Frequency of occurrence =14%)
Stimulus Type: Visual Flash
   Averaged data from 141 samples.
     1: (    -0.40487,    -0.340649,    -0.485844)
     2: (   -0.435584,    -0.362987,    -0.483051)
                              .
                              .
                              .
   249: (   -0.399285,    -0.346233,    -0.477467)
   250: (   -0.388116,    -0.326688,    -0.455129)

Stimulus #6: (Frequency of occurrence =14%)
Stimulus Type: Physical Vibration
   Averaged data from 129 samples.
     1: (   -0.415064,    -0.366233,    -0.469999)
     2: (   -0.390649,     -0.34487,    -0.469999)
                              .
                              .
                              .
   249: (   -0.378441,    -0.332662,    -0.473051)
   250: (   -0.384545,    -0.366233,     -0.45474)

Stimulus #7: (Frequency of occurrence =14%)
Stimulus Type: Audio Click
   Averaged data from 137 samples.
     1: (   -0.405196,      -0.3391,    -0.468418)
     2: (   -0.410943,    -0.336226,    -0.479913)
                              .
                              .
                              .
   249: (    -0.38508,    -0.333352,    -0.451175)
   250: (   -0.376458,    -0.330479,    -0.479913)
```