

## V. DATA ANALYSIS

### FAST TRACK Data Analysis

1. Enter the **Review Saved Data** mode.

- Note Channel Number (CH) designations.

*Channel Displays*

**CH 1** EEG (hidden\*)

**CH 40** alpha

**CH 41** beta

**CH 42** delta

**CH 43** theta

- Note measurement box settings:

*Channel Measurement*

**CH 40** Stddev

**CH 41** Stddev

**CH 42** Stddev

**CH 43** Stddev

**SC** Freq

2. Set up your display window for optimal viewing of the channels 40 – 43.

3. Use the I-Beam cursor to select the first “Eyes closed” data.



Data Analysis continues...

### Detailed Explanation of Data Analysis Steps

If entering **Review Saved Data** mode from the Startup dialog or lessons menu, make sure to choose the correct file.

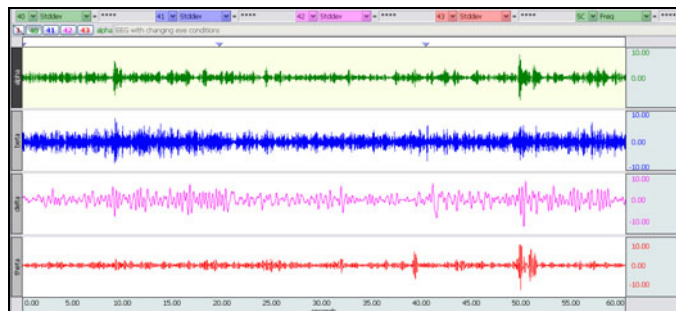


Fig. 3.9 Example data

The EEG channel is hidden but can be easily brought into view. (See Step 2.)

The measurement boxes are above the marker region in the data window. Each measurement has three sections: channel number, measurement type, and result. The first two sections are pull-down menus that are activated when you click them.

#### Brief definition of measurements:

**Stddev:** Standard deviation is a measure of the variability of data points. The advantage of the Stddev measurement is that extreme values or artifacts do not unduly influence the measurement.

**Freq:** Converts the time segment of the selected area to frequency in cycles/sec.

The “selected area” is the area selected by the I-beam tool (including endpoints).

#### Useful tools for changing view:

**Display menu:** Autoscale Horizontal, Autoscale Waveforms, Zoom Back, Zoom Forward

**Scroll Bars:** Time (Horizontal); Amplitude (Vertical)

**Cursor Tools:** Zoom Tool

**Buttons:** Overlap, Split, Show Grid, Hide Grid, +, -

**Hide/Show Channel:** “Alt + click” (Windows) or “Option + click” (Mac) the channel number box to toggle channel display.

This is the data from the time 0 to the first event marker.

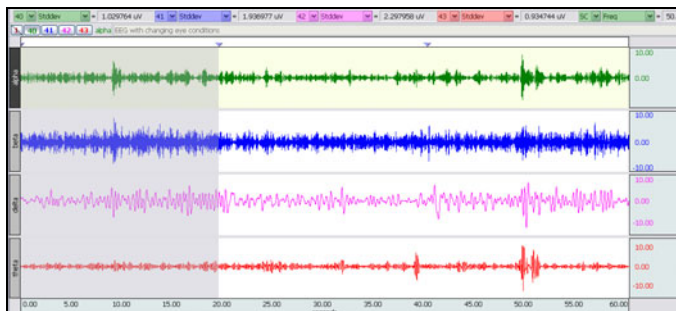


Fig. 3.10 First Eyes Closed data

4. Repeat Step 3 using “**Eyes open**” data.



A

5. Repeat Step 3 using the second “**Eyes closed**” data.



A

6. **Zoom** in on a 3 – 4 second section of the first “**Eyes closed**” data.

7. Use the **I-beam** cursor to select an area that represents one cycle in the **alpha** wave (Fig. 3.11).



B

8. Repeat Step 7 for two other **alpha** wave cycles.



B

9. Repeat Steps 7 – 8 using the **beta** wave data.



B

10. Repeat Steps 7 – 8 using the **delta** wave data.



B

11. Repeat Steps 7 – 8 using the **theta** wave data.



B

12. Answer the questions at the end of the Data Report.

13. **Save** or **Print** the Data Report.

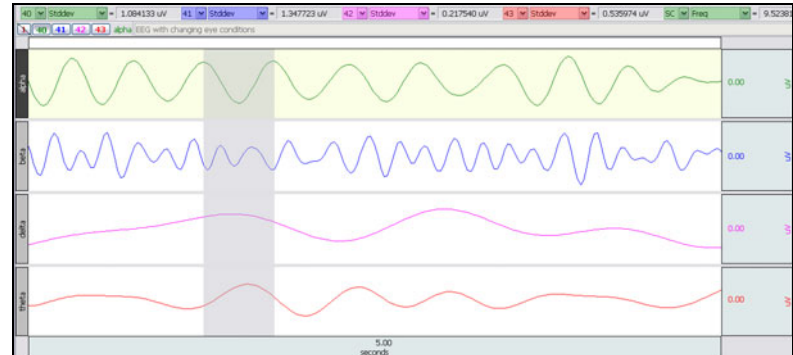
14. **Quit** the program.

**END OF DATA ANALYSIS**

This is the data between the first and second event markers.

This is the data between the second event marker and the end of the file.

Accurate Frequency calculation requires a selected area of only one cycle.



**Fig. 3.11 Selected area shows one cycle of the alpha wave.**

Make sure you stay in the first “**Eyes Closed**” data region.

Click the cursor/pointer into the **beta** wave region to select this channel for “SC” measurements. (Channel label will darken.)

Click the cursor/pointer into the **delta** wave to select this channel for “SC” measurements.

Click the cursor/pointer into the **theta** wave to select this channel for “SC” measurements.

An electronically editable **Data Report** is located in the journal (following the lesson summary,) or immediately following this Data Analysis section. Your instructor will recommend the preferred format for your lab.

### END OF LESSON 3

Complete the Lesson 3 Data Report that follows.

# ELECTROENCEPHALOGRAPHY I

• EEG I

## DATA REPORT

Student's Name: \_\_\_\_\_

Lab Section: \_\_\_\_\_

Date: \_\_\_\_\_

### I. Data and Calculations

#### Subject Profile

Name: \_\_\_\_\_

Height: \_\_\_\_\_

Age: \_\_\_\_\_

Gender: Male / Female

Weight: \_\_\_\_\_

#### A. EEG Amplitude Measurements from Standard Deviation measurements

Table 3.2 Standard Deviation [Stddev]

Rhythm	CH Measurement	Eyes Closed	Eyes Open	Eyes Re-closed
Alpha	40 Stddev			
Beta	41 Stddev			
Delta	42 Stddev			
Theta	43 Stddev			

#### B. EEG Frequency Measurements from first 'Eyes closed' data

Table 3.3 Frequency (Hz)

Rhythm	CH Measurement	Cycle 1	Cycle 2	Cycle 3	Mean
Alpha	SC Freq				
Beta	SC Freq				
Delta	SC Freq				
Theta	SC Freq				

### II. Questions

C. List and define two characteristics of regular, periodic waveforms.

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D. Compare and contrast synchrony and alpha block.

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E. Examine the alpha and beta waveforms for change between the “eyes closed” state and the “eyes open” state.

i. Does **desynchronization** of the alpha rhythm occur when the eyes are open?

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ii. Does the beta rhythm become more pronounced in the “eyes open” state?

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F. The amplitude measurements (Stddev) are indicative of how much alpha activity is occurring in Subject. But, the amplitude values for beta do not truly reflect the amount of mental activity occurring with the eyes open. Explain.

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G. Examine the delta and theta rhythm. Is there an increase in delta and theta activity when the eyes are open? Explain your observation.

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H. Define the following terms:

i. Alpha rhythm

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ii. Beta rhythm

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iii. Delta rhythm

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iv. Theta rhythm

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**III. OPTIONAL Active Learning Portion**

A. *Hypothesis*

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B. *Materials*

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C. *Method*

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D. *Set Up*

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E. *Experimental Results*

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