

V. DATA ANALYSIS

FAST TRACK Data Analysis

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

- Note Channel Number (CH) designations:

Channel	Displays
CH 2	Airflow (temp)
CH 40	Respiration

- Note measurement box settings:

Channel	Measurement
CH 40	Delta T
CH 40	BPM
CH 40	p-p
CH 2	p-p

2. **Zoom** in to select about four respiration cycles in the **Respiration** data.

3. Use the **I-Beam** cursor to select the area of inspiration.



Data Analysis continues...

Detailed Explanation of Data Analysis Steps

Enter the **Review Saved Data** mode from the Lessons menu.

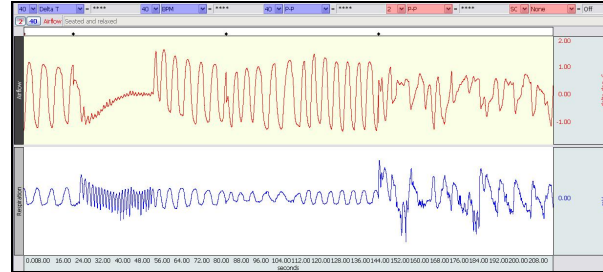


Fig. 8.12 Example data

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


Brief definition of measurements:

Delta T: Measures the difference in time between the end and beginning of the selected area.

BPM: The **Beats Per Minute** measurement first calculates the difference in time between the beginning and end of the selected area (seconds/beat,) and divides this value into 60 seconds/minute.

P-P (Peak-to-Peak): Subtracts the minimum value from the maximum value found in the selected area.

The selected area is the area selected by the **I-Beam** tool (including endpoints).

Note: The append event markers  mark the beginning of each recording. Click on (activate) the event marker to display its label.

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.

In the following example, the Respiration data (bottom, CH 40) is used. The start of inspiration is where the data begins to trend upward and the end of inspiration is at the next peak. The ΔT measurement is the duration of inspiration.

TIP: It may be helpful to hide CH 2 Airflow (temp) to avoid confusion.

4. Select the area of expiration.



5. Select the area that includes both the inspiration and expiration data used in Steps 3 and 4, and measure the total duration, the breathing rate (BPM) and the relative ventilation amplitude (depth).



6. Repeat Steps 3-5 for two other respiratory cycles in the **δEupnea** data recording.



7. Find the total duration, breathing rates and relative ventilation amplitude within the **δHyperventilation and recovery**, **δHypoventilation and recovery**, and **δCoughing and reading aloud** data recordings as needed to fill in the Data Report tables.



8. Using the **I-Beam** cursor, select the interval between the maximal inspiration (Respiration -CH 40) and maximal Airflow (temp) δ CH 2 for each data recording needed to complete the table.



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

10. **Save** or **Print** the data file

11. **Quit** the program.

END OF DATA ANALYSIS

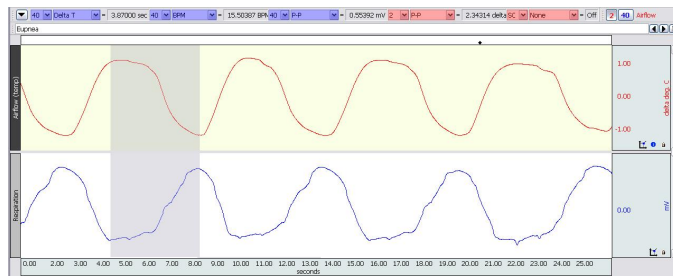


Fig. 8.13 Area of Inspiration

Example of selecting area of expiration using Respiration data (CH 40).

- The **start** of expiration is where the data begins to trend downward from the peak.
- The **end** of expiration is when the data returns to its baseline value.

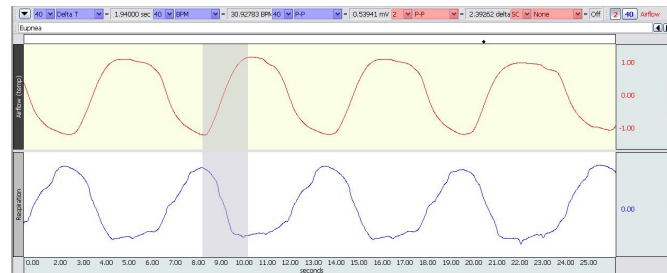


Fig. 8.14 Area of Expiration

Example of selecting one complete respiration cycle (inspiration + expiration data). From the measurements, obtain the total duration (CH 40 Delta T,) the breathing rate (CH 40 BPM,) and relative ventilation depth (CH 40 P-P).

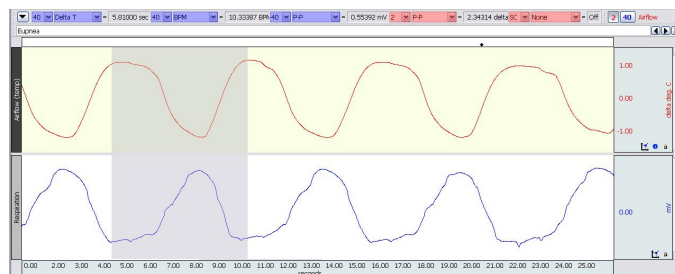


Fig. 8.15 One complete respiration cycle selected

Note: **δCoughing and reading aloud** recording only requires one measurement. (Cough data should show downward spike when **Subject** coughed.)

Record the Delta T (time interval) between the two peaks and the **P-P** [CH 2] (temperature amplitude).

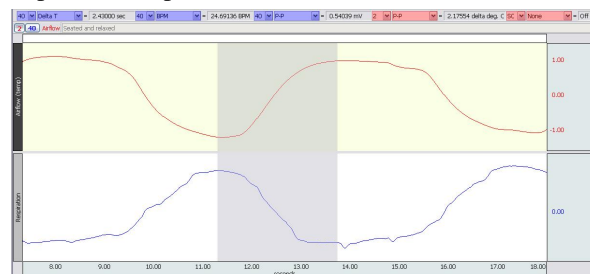


Fig. 8.16 Area from max. Respiration to max. Airflow

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 8

Complete the Lesson 8 Data Report that follows.

C. Relative Ventilation Depths (all recordings)

Table 8.3

Depth	40 P-P			Mean Calculated
	Cycle 1	Cycle 2	Cycle 3	
Eupnea				
Hyperventilation				
Hypoventilation				
Cough				

D. Association of Respiratory Depth and Temperature (eupnea, hyperventilation, hypoventilation)

Table 8.4

Measurement	Eupnea	Hyperventilation	Hypoventilation
2 P-P Peak Delta Temp			
40 Delta T Delta T between Max inspiration and Peak Delta Temp			

II. Questions

E. If the subject held breath immediately after hyperventilation and hypoventilation, would the subject hold breath longer after hyperventilation or hypoventilation? Why?

F. After a brief period of hyperventilation, apnea vera occurs.

i. Define hyperventilation.

ii. Define apnea vera.

iii. Describe the feedback loop causing apnea vera.

G. i. What changes occur in the body with hypoventilation?

ii. How does the body adjust rate and depth of ventilation to counteract the effects of hypoventilation?

H. In which part of the respiratory cycle is temperature:

Highest? _____ Lowest? _____

Explain why temperature varies with the respiratory cycle.

I. Describe or define cough in terms of modification of the breathing cycle.

J. What modifications of the breathing cycle occur when reading aloud? Why?

K. Refer to Table 8.1 data: During eupnea, did the subject inspire immediately after the end of expiration or was there a pause? Explain the stimulus and mechanism to initiate inspiration.

L. Referring to Table 8.3 data: Are there differences in the relative ventilation depths?

III. OPTIONAL Active Learning Portion

A. *Hypothesis*

B. *Materials*

C. *Method*

D. *Set Up*

E. *Experimental Results*
