

Olfactory Conditioning Apparatus for Fruit Flies

Week 10 – April 9 to April 15, 2009

Team Members: Rob Bjerregaard – Team Leader
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Problem Statement:

The aim of this project is to improve or completely re-design a device that is currently used to test fruit flies' olfactory sense, memory, and ability to learn. The current device is producing some inaccurate results because the fruit flies experience changes in air pressure and airflow. Airflow and pressure change need to be kept at a minimum while odors are introduced and cleared from the device.

Restatement of Last Week's Goals:

The team's goals from last week were to place final orders for pumps, electric paint, etched cylindrical shocker, and to continue assembly as parts arrive.

Summary of Accomplishments:

- Completed mineral oil bubbling assembly
- Researched pressure gauges and transducers
- New center slider has been fabricated and is currently being shipped
- Pumps have been ordered and should arrive Friday (tomorrow)

Team Goals:

- Assemble everything – revised center slider, pumps, tubing with valves, and new mineral oil bubbling assembly
- Begin testing and comparisons between old and new devices

Activities:

Rob	4.9.2009	Meeting with client – orders for pump, center slider, and cylindrical shocker confirmed	1 hr	2 hrs
	4.15.2009	Research – pressure gauges/transducers	1 hr	
Graham	4.9.2009	Meeting with client – orders for pump, center slider, and cylindrical shocker confirmed	1 hr	2 hrs
	4.13.2009	Preliminary attempts at testing	1 hr	
Chuck	4.9.2009	Meeting with client – orders for pump, center slider, and cylindrical shocker confirmed	1 hr	1 hr
Scott	4.10.2009	Completed mineral oil bubbler assembly	1 hr	3 hrs
	4.12.2009	Research – pressure gauges/transducers	1 hr	
	4.13.2009	Preliminary attempts at testing	1 hr	

Difficulties:

The etched cylindrical shocker piece was not fabricated as planned. Mike Fasano thought that his rapid prototyping machine could make it, but it did not turn out so well. He said that he will send us what he made free of charge. When the part arrives, we will decide whether or not it can be used, but the chances look grim.

After looking into pressure gauges and transducers, it looks like only precise transducers will be able to accurately monitor small pressure differences. The simple gauges are much less accurate, but also much cheaper. The transducers would cost between \$200 and \$350 a piece, and we would need either two or three. Jerry has told us that he would like to continue working with us or other members of the department in the future, so incorporating real-time pressure monitors with digital readouts can be pursued in the future.

Project Timeline:

	February				March				April				
Tasks	4	11	18	25	4	11	18	25	1	8	15	22	29
Project research	█	█	█	█	█	█	█	█					
Brainstorming	█	█	█	█	█	█	█	█					
PDS		█	█	█	█	█	█	█					
Prototype design				█	█	█	█	█					
Prototype building						█	█	█	█	█			
Actual device design						█	█	█	█	█			
Ordering							█	█	█	█	█		
Expected shipping							█	█	█	█	█		
Device manufacturing							█	█		█	█	█	█
Testing							█	█			█	█	█
Re-designing							█	█			█	█	█
Re-testing							█	█				█	█
Presentation					█		█	█					█
Progress report	█	█	█	█	█	█	█	█	█	█	█	█	█
Website	█	█	█	█	█	█	█	█	█	█	█	█	█

Expenses:

Tubing and connections have cost around \$200, the new center piece costs \$320, and the etched cylinder is now free (but probably not functional). The pumps cost around \$80 a piece (we ordered two).