

## **Adjustable wave tube stand for Acoustic Reflection Technique**

**Week:** November 23rd – November 30th

**Client:** Erin Douglas, MS-CCC-SLP  
Vocal Tract Development Lab - 430 Waisman Center  
Phone: 608-263-5610  
Email: [edouglas@waisman.wisc.edu](mailto:edouglas@waisman.wisc.edu)

**Advisor:** Dr. Willis J. Tompkins  
2134 Engineering Centers Building  
Phone: 608-263-1581  
Email: [tompkins@engr.wisc.edu](mailto:tompkins@engr.wisc.edu)

**Team:** Ryan Carroll – Team Leader  
Jeremy Glynn– Communications  
Andrew Bremer – BWIG  
Ben Engel – BSAC

### **Problem Statement**

The Vocal Tract Development lab (VT Lab) plans to compare anatomic measurements secured from Acoustic reflection technology (ART)- also known as acoustic pharyngometry – in the upright and supine position with measurements secured from imaging studies (MRI & CT).

Currently, researchers in the VT Lab need to hold the wave tube in their hands which is presenting variability in the data. It is difficult to hold the wave tube at the same angle during each trial within subjects and across subjects.

Hood Laboratories, the company who manufactures AR technology, has no plans to offer an adjustable stand.

VTLab is requesting for the BME team to design and build a steady stand for the ART wave tube. The stand should be adjustable so that it may be used by individuals of different ages -- young children to adult. Also, the stand must allow the patient's head to remain in a standardized position in the upright and supine position. Another important criterion is that the stand/unit should be easy to clean and disinfect.

### **Last Week's Goals**

- Mill out curvature for interface piece. (Should be fairly easy when our bit arrives.)
- Screw in connective straps and connect to stand.
- Place gripping material.
- Mark measurements on stand. Stand is finished.
- Divide up work for final paper.

### **Accomplishments**

- Milled out curvature for interface piece.
- Met with client on 11/30 to ensure fitting of piece first before placing gripping

material and connective material to interface piece.

**This Week's Goals**

- Finish stand this upcoming weekend.
- Start work on poster presentation

**Difficulties**

**Team Effort**

Team Member	Accomplishments	Time (Hrs)	Running Total (Hrs)
Ryan Carroll	Progress report, Interface piece work, Team meeting	3.0	34.5
Ben Engel	BSAC, Interface piece work, Team meeting	3.0	34.5
Jeremy Glynn	Client contacts, Interface piece work, Materials testing, Team meeting	3.0	34.5
Andrew Bremer	Website, Interface piece work, Team meeting	3.0	34.5

## Project Schedule

TASK	SEPT			OCT				NOV					DEC			
DATES	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28
<b>WORK</b>																
Brainstorming	█	█	█	█	█					█						
Research	█				█	█	█	█								
Designing Prototype		█		█		█			█	█	█	█				
Selecting Prototype						█	█									
Obtaining Materials						█		█	█	█	█					
Building Prototype									█	█	█	█				
Testing Prototype										█		█				
Modifications											█					
<b>DELIVERABLES</b>																
PDS		█	█		█											
Mid-Sem. Report							█	█								
Mid-Sem. Presentation						█	█									
Final Report																
Final Presentation																
Weekly Reports	█	█		█	█	█	█	█	█	█	█	█				
Notebooks	█	█	█	█	█	█	█			█	█					
<b>MEETINGS</b>																
Team Meetings	█	█			█	█			█	█	█	█				
Client Meetings	█	█		█					█			█				
Advisor Meetings		█		█	█	█			█			█				
BSAC Meetings		█	█		█		█		█			█				
<b>OTHER</b>																
Web Page					█	█	█		█	█	█	█				
Special Lectures			█						█	█						

### Expenses to Date:

- **MB1 Boom Stand** – \$34.98
  - Purchased by Ryan Carroll on 10/12/2007
  - GearTree.com
  - Paid by Credit
  - Status: Shipping
- **Rubber Belt Strap** - \$9.49
  - Purchased by Ryan Carroll on 10/17/2007
  - Shentech.com
  - Paid By Credit
  - Status: Received

- **UHMW Polyethylene Sheet - \$39.29**
  - Purchased by Ben Engel on 10/30/2007
  - McMaster.com
  - Paid by Credit
  - Status: Shipped
- **Interface Hardware (Screws, Mounting Brackets, ect.) - \$8.00**
  - Purchased by Ben Engel on 11/15/2007
  - Local Hardware Store
  - Paid by Credit
  - Status: Received
- **Ball End Mill Piece – \$26.90**
  - Purchased by Jeremy Glynn on 11/16/2007
  - Endco.com
  - Paid by Credit
  - Status: Shipped  
(When finished, we're investigating selling this item to the ECB Shop.)

**Total: \$118.66**