

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

**Week:** November 2nd – November 9th

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**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.

VT Lab 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**

- Obtain HDPE.
- Finalize SolidWorks, Mill interface.
- Hopefully, obtain stand. Investigate means of attachment of interface to stand.
- Test gripping lining with cleaning solution. If needed, purchase gripping lining.
- Start assembly.

### **Accomplishments**

- Received HDPE.
- Received Stand. Assembled Stand. Even as a standalone component, the stand

appears to be exactly what is needed for our design.

- On Thursday of this week we will take steps to start milling our piece.
- Also on Thursday of this week we will be picking up “Caviwipes” disinfectant wipes to test the compliance with our gripping material. There shouldn’t be any issues but it is a good safety precaution.

### **This Week’s Goals**

- Optimize stand (Details listed below)
  - Place markings for measurements
  - Stand has many moveable parts, most are unnecessary. Lock off these unnecessary parts.
- Meet with client to present roughly completed interface, and stand. At this meeting we will bring the rubber straps and gripping lining so we can physically place the wave tube in the holder to make sure everything is going smoothly. This will also allow for us to make measurements for the rubber straps
- Within the next few weeks these all need to be completed as well.
  - Connect rubber straps
  - Place gripping lining (or purchase more if necessary).
  - Devise a connection between the interface and stand
- Ideally, the stand will be complete before Thanksgiving.

### **Difficulties**

#### **Team Effort**

Team Member	Accomplishments	Time (Hrs)	Running Total (Hrs)
Ryan Carroll	Progress report, Interface piece work, Team meeting	3.0	25.5
Ben Engel	BSAC, Interface piece work, Team meeting	3.0	25.5
Jeremy Glynn	Client contacts, Interface piece work, Materials testing, Team meeting	3.0	25.5
Andrew Bremer	Website, Interface piece work, Team meeting	3.0	25.5

## 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

**Total:** \$83.76