

NORTHERN  
ARIZONA  
UNIVERSITY



# PORTABLE SANITIZATION CHAMBER

**MIDPOINT PRESENTATION**

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# Overview

- Introduction
- Project Status
  - Chamber Assembly
  - Procedural Testing
  - Safety Assessment
  - Control System
- Progression Plan



# INTRODUCTION

- W.L. Gore & Associates
- Portable Sanitization Chamber
- Decrease bioburden levels of *Bacillus atrophaeus*
- \$3,000 budget



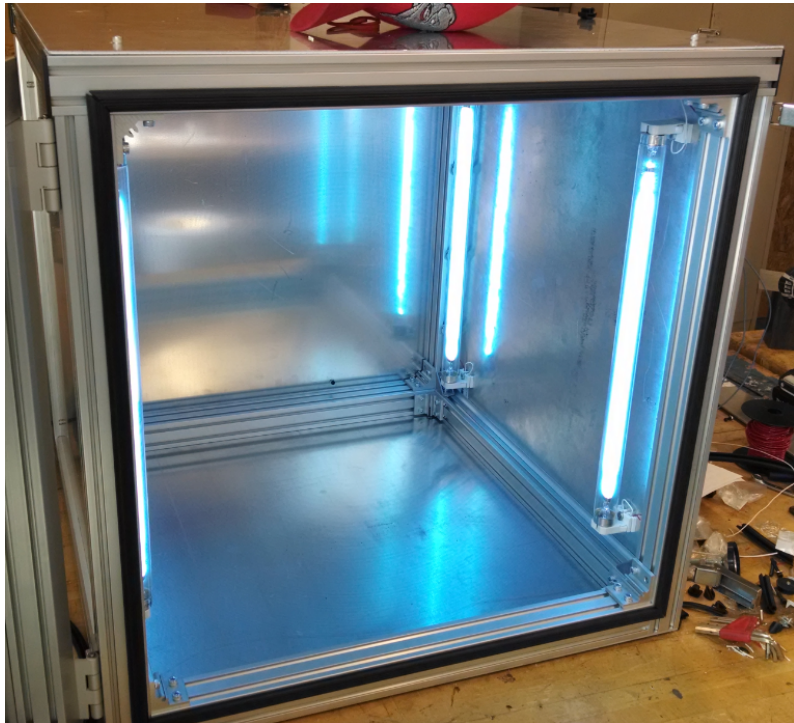
# CHAMBER ASSEMBLY -FRAME



# CHAMBER ASSEMBLY

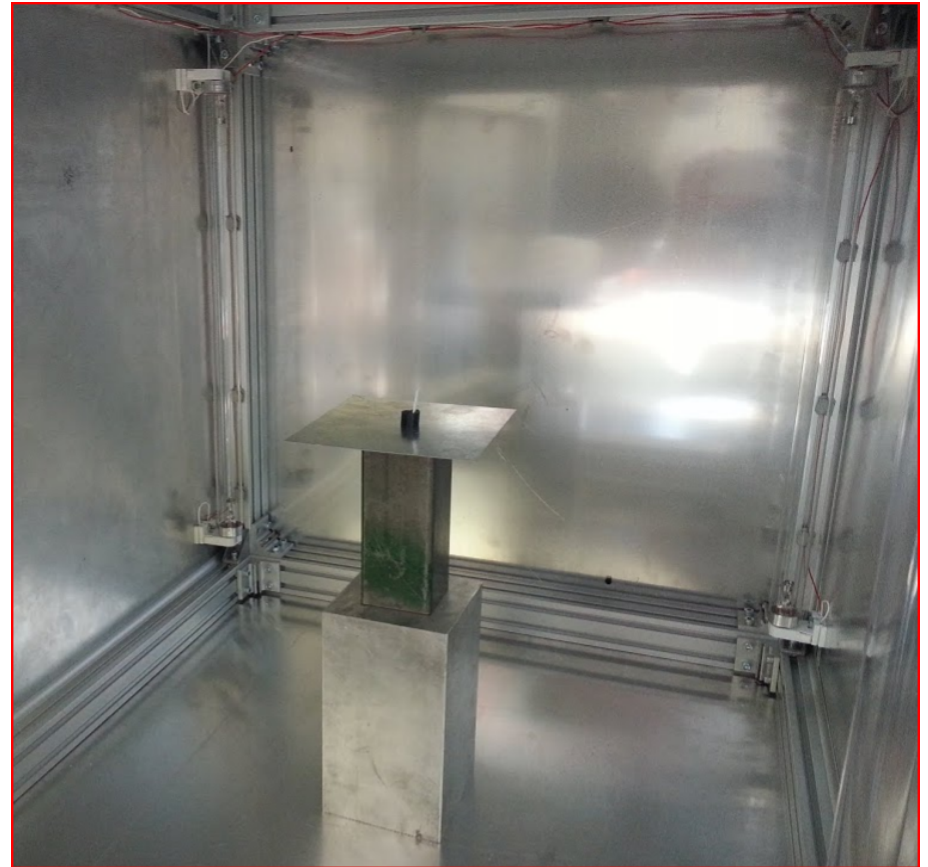


# CHAMBER ASSEMBLY- FOGGER & LIGHTS



# PROCEDURAL TESTING

- Three test strips with *Bacillus atrophaeus*
- Procedures chosen to validate sanitizing effectiveness
- Strips exposed in chamber on stand to test maximum distance



# PROCEDURAL TESTING

- First Test
  - Exposure to UV without  $\text{H}_2\text{O}_2$  vapor
  - Five minute process
- Second Test
  - Chamber filled with  $\text{H}_2\text{O}_2$  vapor for one second
  - Exposed to UV for five minutes
  - Compare results to first test
- Third Test
  - Chamber filled with  $\text{H}_2\text{O}_2$  vapor for five seconds
  - Exposed to UV for five minutes
  - Compare to first and second test

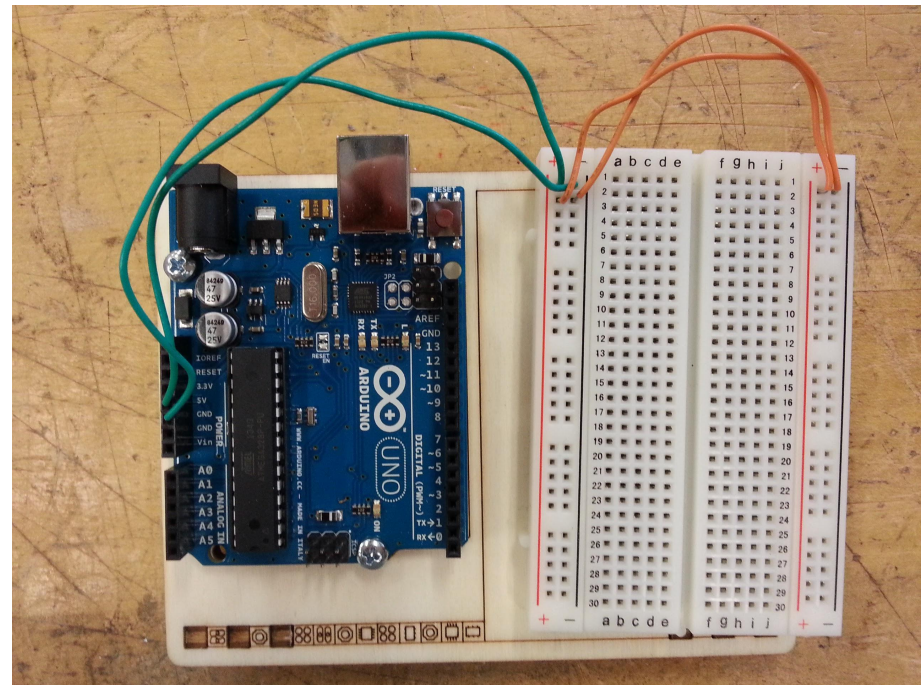


# SAFETY ASSESSMENT

- Fog machine gets hot during the operating
  - Add proper labels
  - Add heat shield to fog machine for safety
- Tube starts 'melting' as the temperature gets too hot
  - Find tube material with higher melting temperature
  - Or move fogger inside chamber
- There is a gap in the door seal
  - Softer sealing material
  - Tighten/eliminate spring on door latch

# CONTROL SYSTEM

- Arduino Uno microcontroller
- Will run code and logic for automated process and user interface
- Expect to have:
  - Indicator lights
  - Time display
  - Door lock



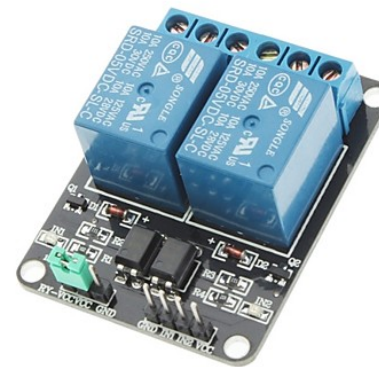
# CONTROL SYSTEM

- Current relays incompatible
  - Switch voltage greater than 5V



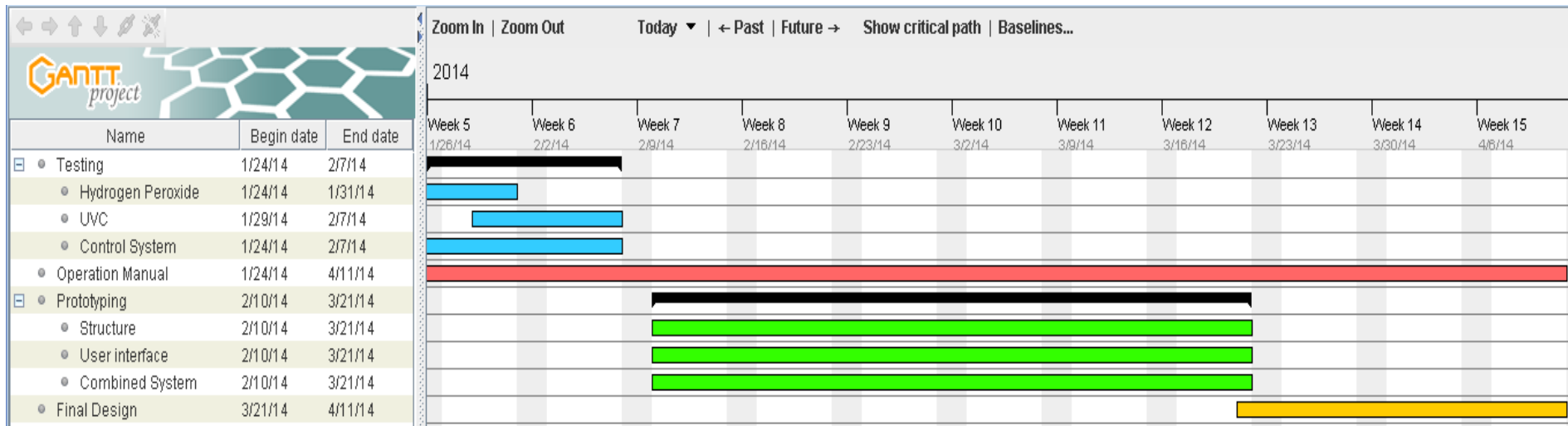
[www.allelectronics.com](http://www.allelectronics.com)

- EE Consultant redirects to new relay
  - 2 Channel 5V High Level Trigger Relay Module for Arduino



[www.miniinthebox.com](http://www.miniinthebox.com)

# PROGRESSION PLAN



# Conclusion

- With the chamber complete, extensive testing on procedure validity can commence
- Focus can now be geared towards addressing and complying with design requirements



# References

*Relay*. Digital image. *Www.allelectronics.com*. Electronics Corp, n.d. Web.

*2 Channel 5V High Level Trigger Relay Module for Arduino*. Digital image. *Http://www.miniinthebox.com*. Miniinthebox, n.d. Web.