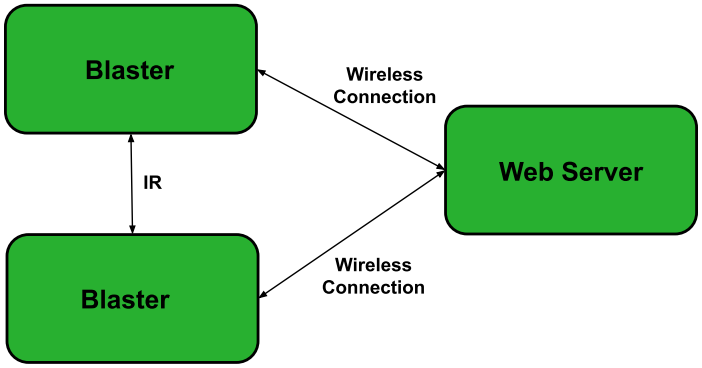
Rayna Choi, Brianna Dewey, Allison Gentry, Leo Herman, Kyle Tomasula

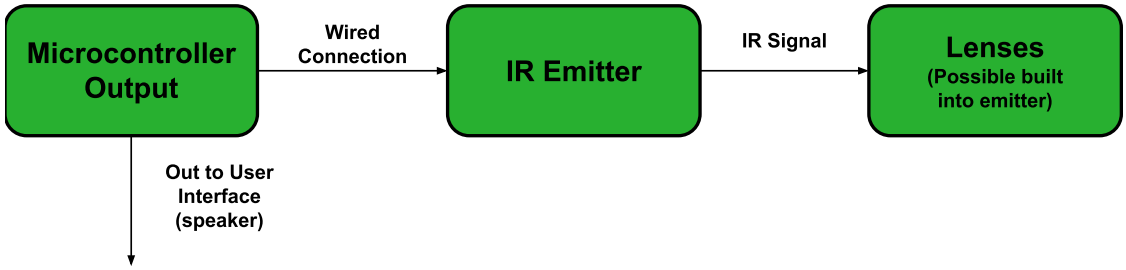
Design Review 0

System Block Diagrams:

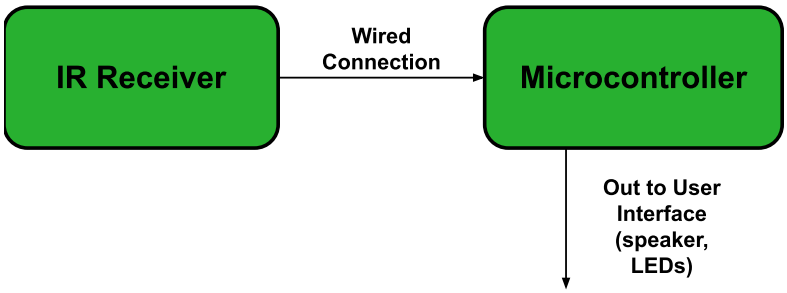
Overall System Block Diagram:



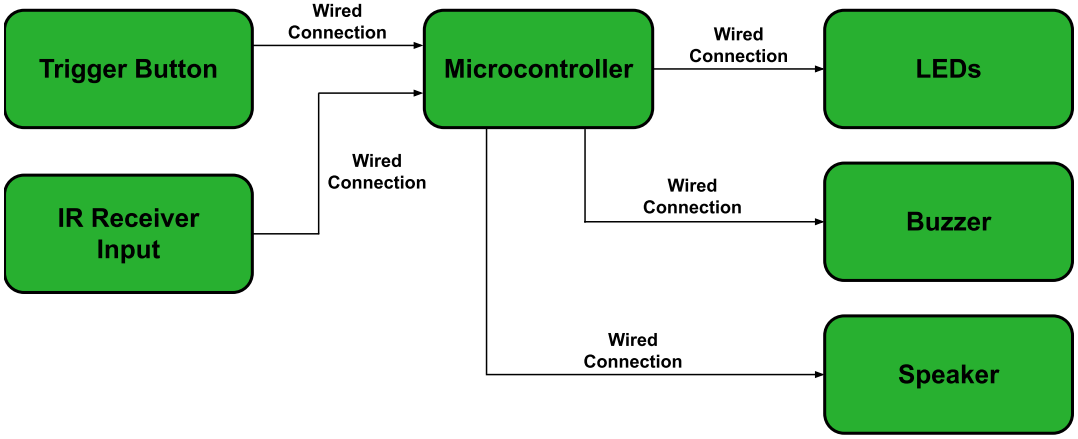
Transmitter Subsystem



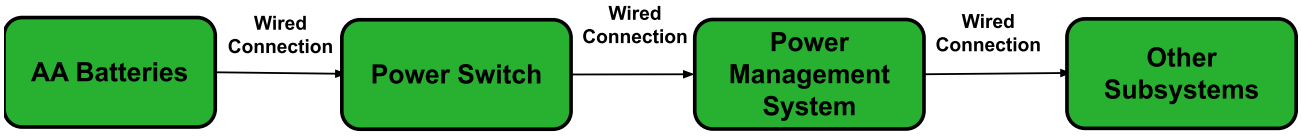
Receiver Subsystem



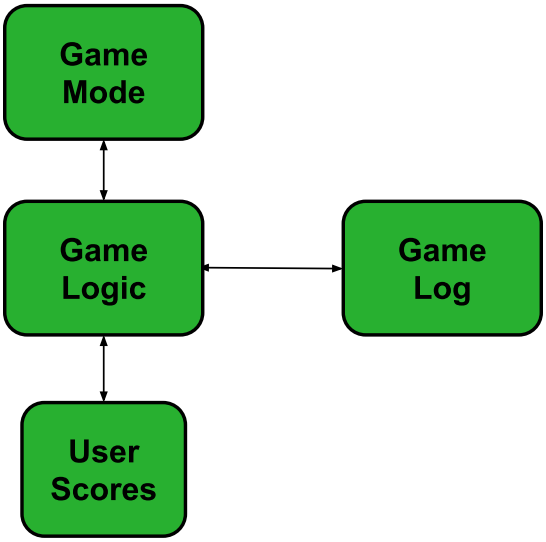
User Interface Subsystem



Power Subsystem



Web Server/ Control Software Subsystem



Subsystem Requirements:

Transmitter

- IR emitter and laser emitter that fires when the actuator is stimulated
- Minimal spread from IR laser, directional at a distance of 30 feet or less

Receiver

- Must correctly detect hits and relay data to a microcontroller

User Interface

- The actuator should be easy to stimulate
- Have lights, buzzers, speakers to give feedback
- Must keep track of health, received hits, and transmitted hits
- ON/OFF switch

Battery Module:

- Must last at least 24 game hours

Web Server/ Control Software

- Must be able to start the game
- Keeps track of the time, and communicates with the other blasters at a range of 30 feet
- Send out a signal to all modules
- Ability to set and start the timer
- Outputs game information to a screen

Blaster Module

- Houses user interface system
- Houses IR transmitter and receiver system
- Must be lightweight and comfortably fit in the User's hand
- Must clearly be a toy
- Must correctly distinguish between hits and non-hits
- Must house the microcontroller
- Must house the battery pack

Microcontroller

- Must take input from IR sensors & trigger and output to lights, speakers, laser emitter, buzzer
- Must modulate the laser emitter

Design Review Plans:

Week of January 20:

- **Design Review 0**

Week of January 27:

- Provide a detailed design of each major subsystem: transmitter, receiver, user interface, battery module, web server, blaster module, and microcontroller

Week of February 3:

- Give a detailed description of all major components and describe the function they serve in your design and how the devices realize the required function: IR Emitter, IR receiver, aiming laser, audio speaker, buzzer, LEDs, battery, microcontroller, and buttons
- **Update Meeting**

Week of February 10:

- Specify essential connections on all major components. These would include all power and ground connections (with appropriate values for device voltage and expected current requirement), decoupling, and other essential support connections such as clocking, programming, etc

Week of February 17:

- Give a list of a set of problems that you are not clear on how you will solve them and an action plan to reduce them to solved problems.
- **Design Review 1**

Week of February 24:

- Demonstrate that each subsystem is working. Note that it is not expected that the subsystems work together, rather than each subsystem is doing what is expected and that the subsystem meets the requirements necessary for that subsystem

Week of March 3:

- Provide a preliminary board design that includes all major components, showing appropriate layout and essential connections presented in the previous design review
- **Design Review 2**