

ECE 480 – Design Team 3

Ballistic Chronograph

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Outline

Background

Chronograph Function

Design Goals and Specifications

Solution Design

Budget

Project Plan

Background

A Ballistic Chronograph measures projectile velocity.

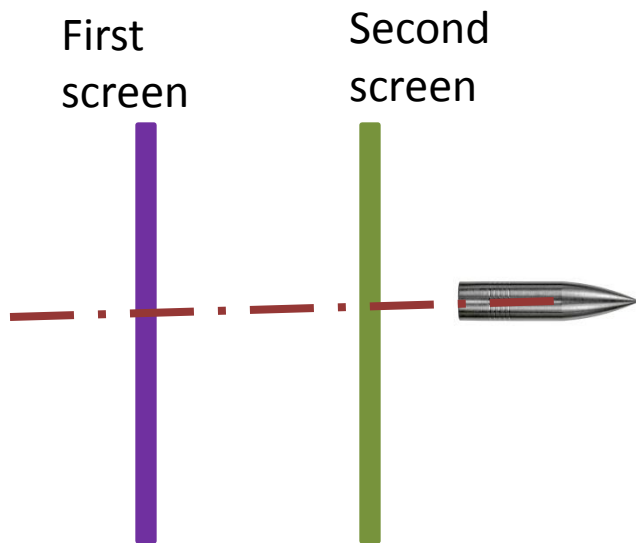


The most common application is measuring the velocity of bullets on a shooting range.

Purpose

- To help the end user understand projectile velocity, and projectile flight.
- To that end, our Chronograph will focus on data acquisition and data reporting to the user.

Basic Chronograph Function



Detect Projectile at First Screen



Detect Projectile at Second Screen



Calculate Velocity

Commercial Options

- Commercial specifications
- Price range of chronographs
- Do-it-yourself barrel attachment
- How could these be improved upon?



Our Design

Accuracy/
Durability

Ease of Use

Cost Efficiency

Wireless



Design Specifications

Accurately record: ballistic speed, temperature, humidity, altitude, air pressure and wind speed in various weather conditions.

Be able to set up and use by anyone in a short amount of time

Simplistic design to keep cost competitive

Bluetooth communication further simplifies data storage by automatically saving it to the users Android phone or tablet.

Concept Design

Screen #1
By laser powered
and LED Bank

Screen #2
By laser powered
and LED Bank

Peripheral
sensors



Microcontroller



LCD display

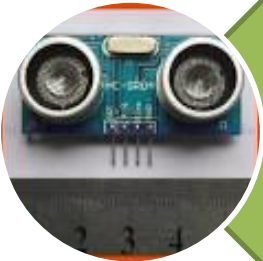
Bluetooth
Package

Android
smart
phone

Solutions



Infrared sensor



Ultrasonic



Laser diode



Laser diode

Line laser





Spread 120°

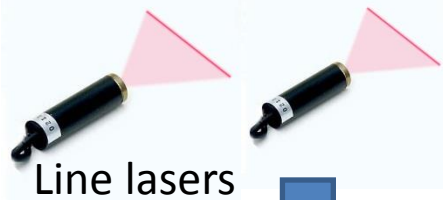
Reliable up to 2 ft

- Reduce the number of Lasers

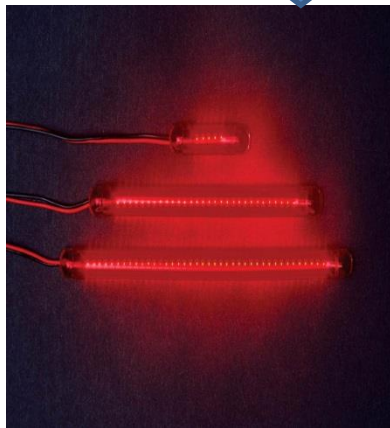
650 nm wavelength

5 mW

Proposed Solution



Sensors (altitude, pressure, temp, humidity)



RED LED bank



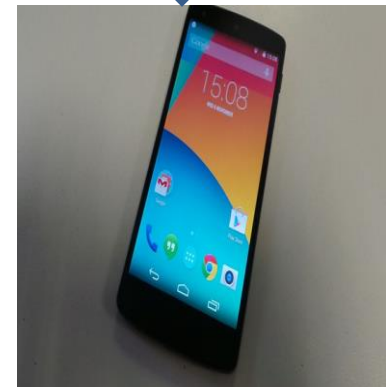
 **Bluetooth®**



LCD display



SD card storage



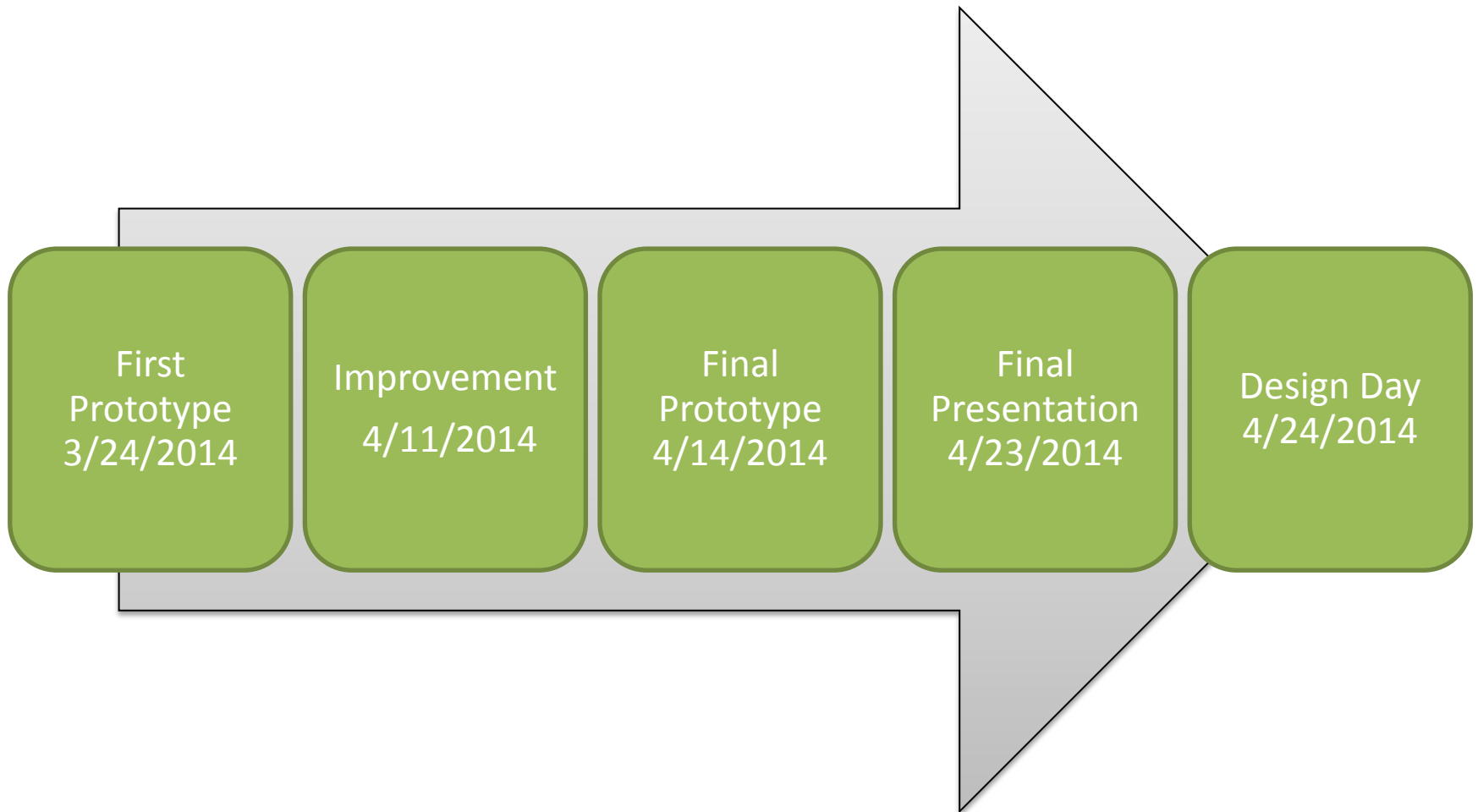
Android phone

Budget

Item	Quantity	Price
Line Laser	2	\$20
Sensors*	x	\$30
SD card	1	\$10
LCD Screen for microcontroller	1	\$10
Projectiles for Testing	x	\$20
Screen Frames	x	\$30
LEDS	x	\$5
Additional Unknown Expenses	x	\$50
Estimated Total		\$175

* includes Temperature, Air pressure, Humidity, Altitude

Project Plan



THANK YOU!

Questions?