PROJECT DISCO

PRESENTATION AND DEMONSTRATION
Team Disco!

- **Group Leader:**
  - Kyle McClary
    - EE major; background in electronics

- **Group members:**
  - Kevin Ufferman
    - EE major; background in electronics
  - Joshua Land
    - EE major; background in RF Technology
    - Employed at the Center for Rapid Product Development, AFRL

- **Advisor**
  - Dr. John Wu
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Block Diagram

9 V Battery

3.3 V Regulator

Altimeter

Arduino Mini

Photoresistor

OpenLog
1 GB Micro SD Card

LED Driver

Speaker

LED Array
PCB Fabrication
Microcontroller Coding

- Arduino Code
  - Based on C/C++
- SoftwareSerial
- pinMode
- Clock Speed
  - Altimeter Master Clock 32kHz
- Photosensor
- SPI

```c
#include <SPI.h>
#include <SoftwareSerial.h>
define rxPin 3
define txPin 2
define ledPin 7
//Set up new serial port for openlog
SoftwareSerial mySerial=SoftwareSerial(rxPin,txPin);
byte pinState =0;

word C1,C21,C22,C2,C3,C6,C51,C52,C5,C6; //Sensor Calibration Coefficients
word W1,W2,W3,W4; //Sensor Calibration Words
byte W11,W12,W21,W22,W31,W32,W41,W42; //Sensor Calibration Words
word T,P=1000; //Default Pressure in mbar

void setup() {
  //define pin modes for tx, rx, led pins
  pinMode(rxPin,INPUT);
  pinMode(txPin,OUTPUT);
  pinMode(ledPin,OUTPUT);
  pinMode(10,OUTPUT);
  mySerial.begin(9600);
  TCCR1B = (TCCR1B & 0xF8) | 1;
  analogWrite(10,128);
  SPI.setDataMode(SPI_MODE0);
  Serial.begin(9600);
  int Dark;
  analogReference(INTERNAL);
  SPI.begin();
  SPI.setBitOrder(MSBFIRST);
  byte cwl1=B11101010;
  byte cwl2=B10000;
  byte cwl11=B11101011;
  byte cwl22=B00000;
  byte cwl31=B11101100;
  byte cwl32=B10000;
  byte cwl41=B11101101;
```
LED Usage and Buzzer Frequency

- LED Testing
  - LED Board Design/Fabrication
- Speaker Testing
  - Frequency Range Sweeping
    - 3V sine & square wave frequency sweep from 1kHz
      - Resonance at 1.19kHz, 3.5kHz
Challenges

- Board Design
- SPI Communication
- Rough design specifications
  - Jan. 28
- Design specifications
  - End of Feb.
- Prototype
  - Mid April (Late parts order and re-design)
- Test & Evaluation
  - Late April
- Further Development & Refinement
  - April-May
- Deliverables
  - Tentative Launch April 30, May 15
Upcoming Work

- Design Nichrome Cutter
  - Second battery, 5-6V High Current
- Test/Logging Launch April 30
  - Try to get on board control package for data logging purposes
- Finish Flight Manifest
Questions?