Dragon Fruit
Final Presentation

Tyler Yamauchi
Kyaw Hein
Advisor: Dr. Anthony Kuh

Overview

- Motivation

- Block Diagram

- Power Budget

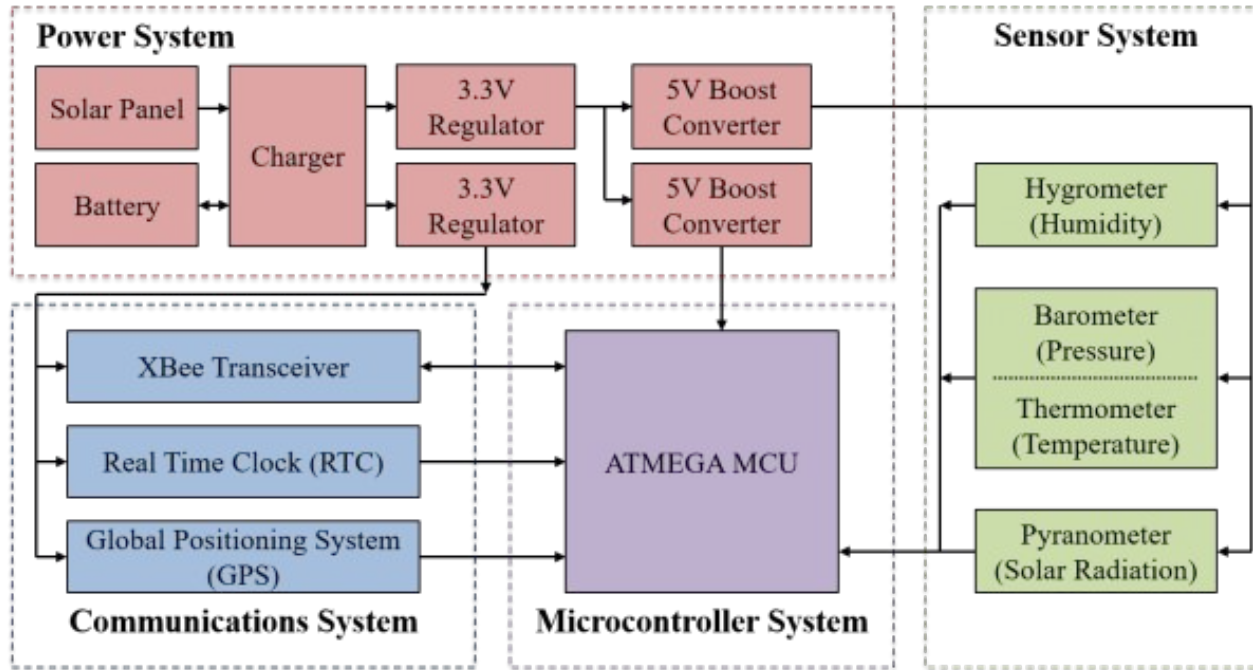- Progress

- Major Problems

- Solutions

- Future Tasks

Project Motivation

To design a weatherbox that maximizes design quality, power efficiency, and processing speed

University of Hawaii at Manoa SCEL

Power Budget

Part	Typical current draw (mA)	Average Current Draw (mA)	Average Power Consumed (mW)	Max Power Consumed (mW)
Xbee	205 mA	16.33 mA	49.568552	49.568552
Vreg 3.3V	0.35	0.175	0.5775	2.97
Atmega 328P (5V)	5.2	5.2	26	45
Solar Irradiance	0.3	0.3	1.5	1.5
Vreg 5v (Atmega)	0.07	0.07	0.35	0.5
ADC 16bit	0.155	0.07775	0.38875	0.95
Barometer	0.005	0.2525	0.83325	0.03
Humidity - HIH6131	0.65	0.3255	1.07415	5

Progress

- Completed soldering all the parts on one of the new boards

- Uploaded firmware on the Atmega chip

- Housing was modified for the new design

- Found potential problems / solutions for XBee voltage issue

Major Problems

- An inductor on the board started heating up when XBee was plugged it

- XBee receiving ~3.9V-4V

- XBee 3.3V plane connected to ground plane via a capacitor

Solutions

- Changed the inductor to a new one with higher current rating
- Soldered a new 3.3V regulator
- Desolder and resolder in new capacitors
- Solder a diode to see if that solves the shorting issue
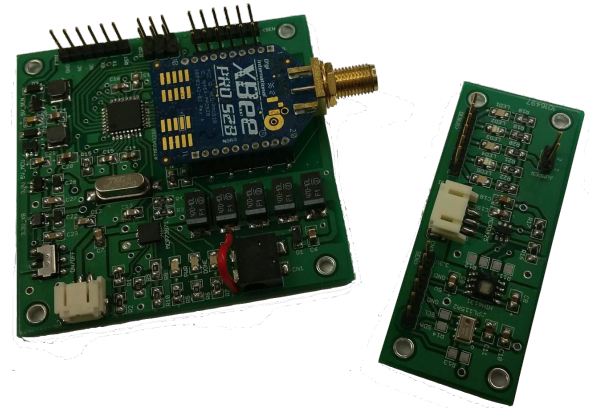
Future tasks

- Research new parts for our 5V booster package

- Test to see if board transmits data

- Test the validity of the V4 data

Schedule

	Confer with Andrew about programming (Gantt Chart)			
Week	13	14	15	16
Date	4/16/2018	4/23/2018	4/30/2018	5/7/2018
Presentations				
Proposal				
Preliminary Design (PDR)				
Critical Design (CDR)				
Final Design (FDR)				
PCB (Version 4.1)				
Analyze Board Design				
Make Board Edits				
Get Board Milled				
Solder Parts				
Programming				
Program Board v3				
Program Board v4				
Housing				
Make Edits				
Print needed parts				
Tests (Current Board)				
Tranmission/Battery				
Current, Voltage, Diode)				
Deployment				
Version 3				
Version 4				
Report				Report DUE!

Image Sources

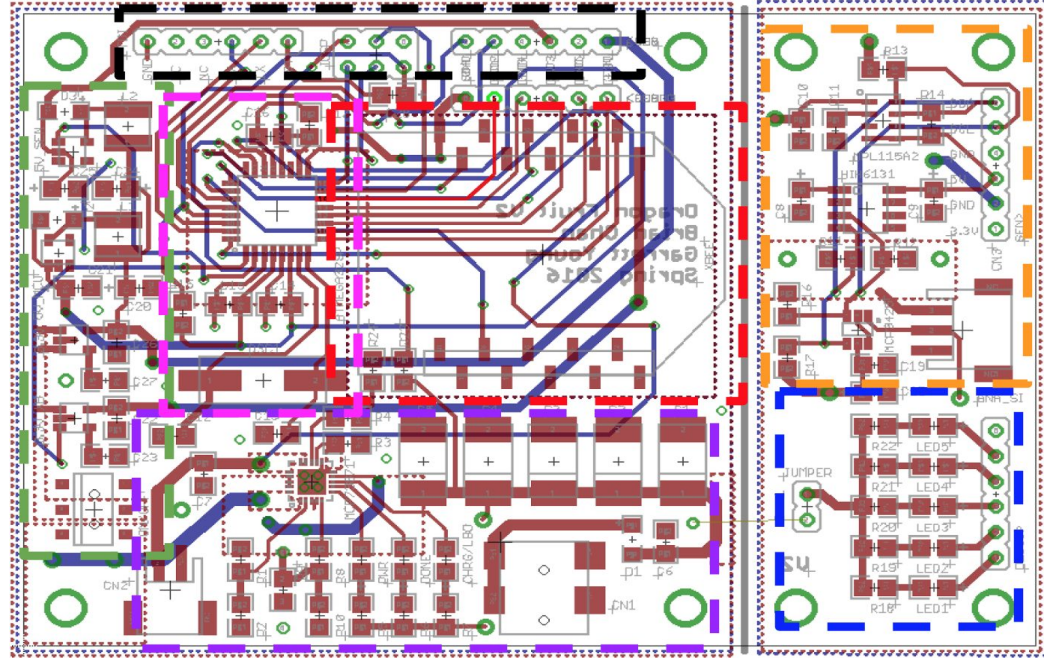http://cryptid-creations.deviantart.com/art/Daily-Paint-1081-Dragon-Fruit-Keeper-570702189

http://www.michaelleestallard.com/wp-content/uploads/Hello-My-Name-Is-Name-Badge.jpg
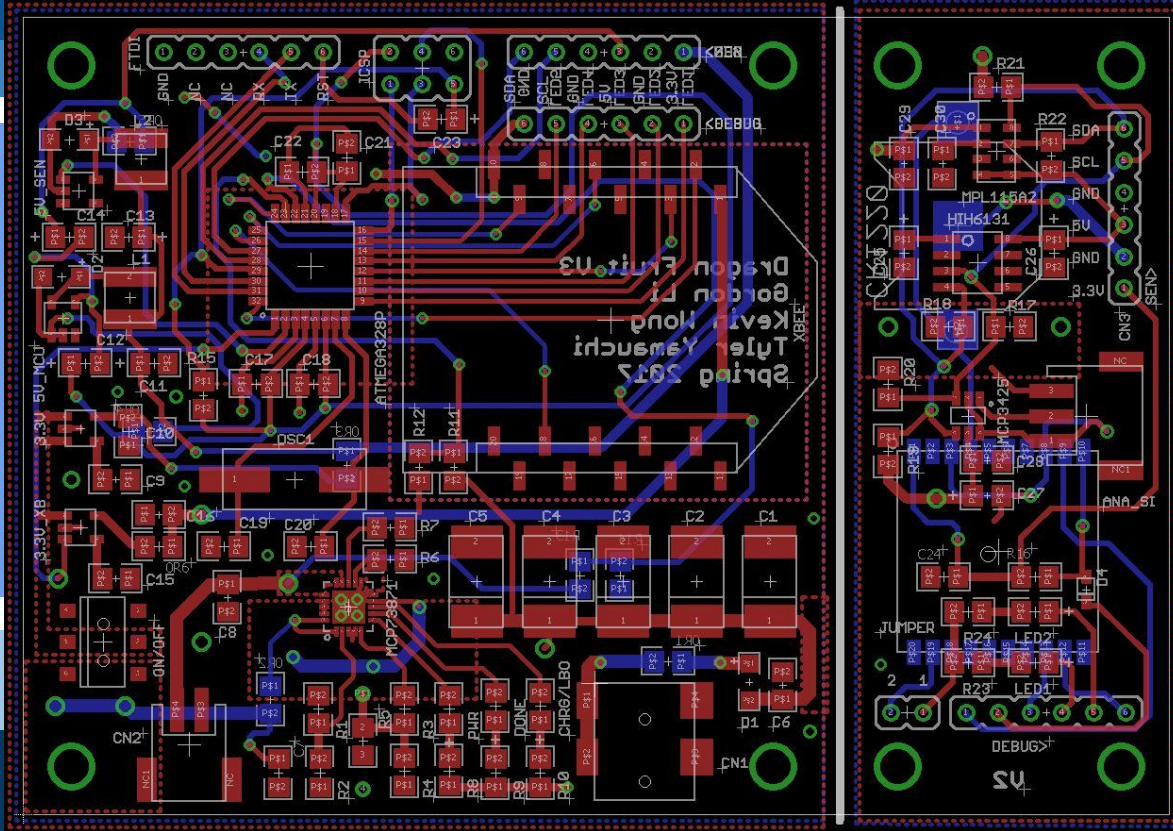
Detailed Block Diagram

Green - Power
Purple - Charging Circuit
Black - Bus interface
Pink - MCU
Red - Xbee
Orange - Sensors
Blue - Debug LEDs

PCB

- Same dimensions
  - 3.59 in (dimension x)
  - 2.5 in (dimension y)