

# Critical Design Review Presentation

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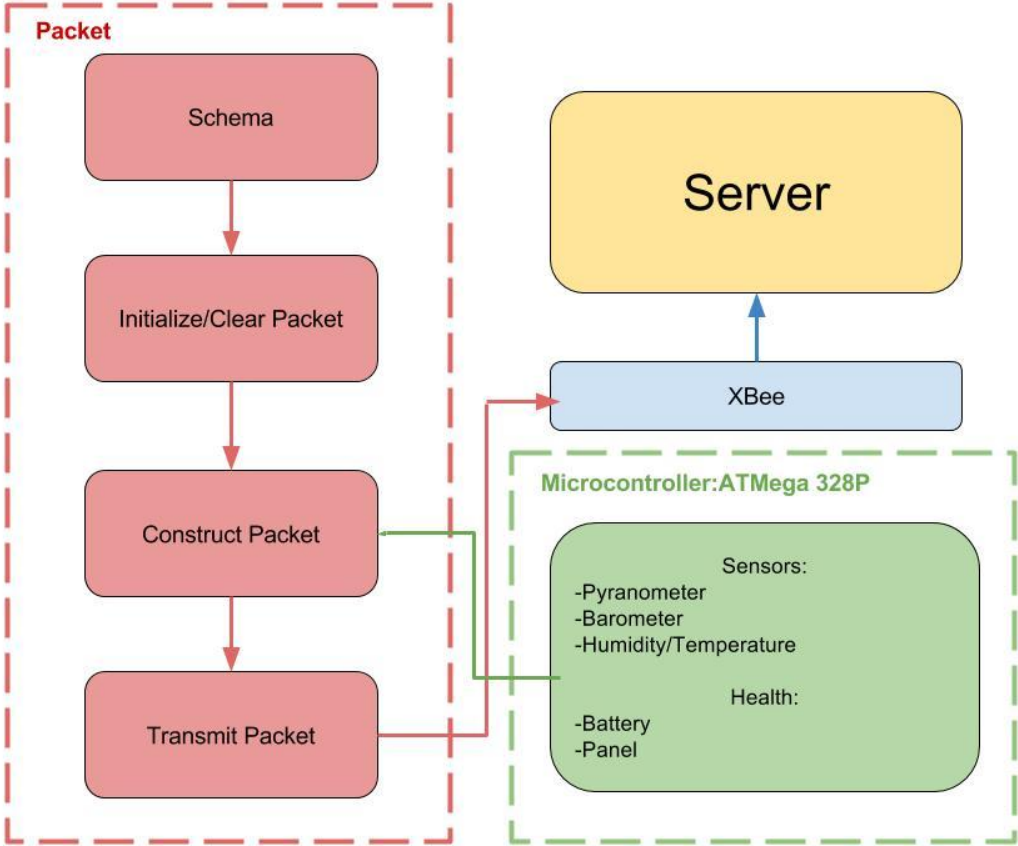
# Overview

- Block Diagrams
- Algorithm
- Progress
- Problems
- Next Steps

# Block Diagram: Hardware



# Block Diagram: Software



# Software: Algorithm

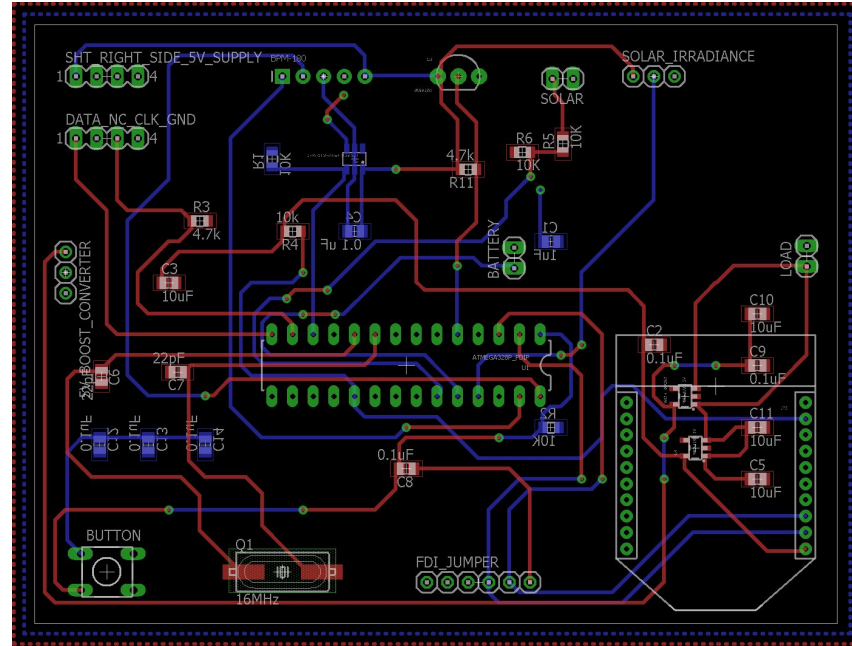
-Set Up:

- Initialize XBee, Sensors and Software Serial Monitor

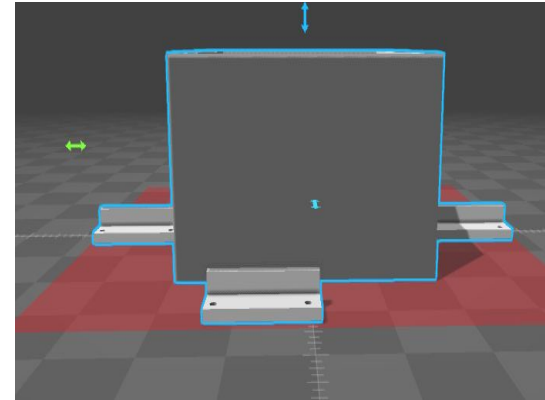
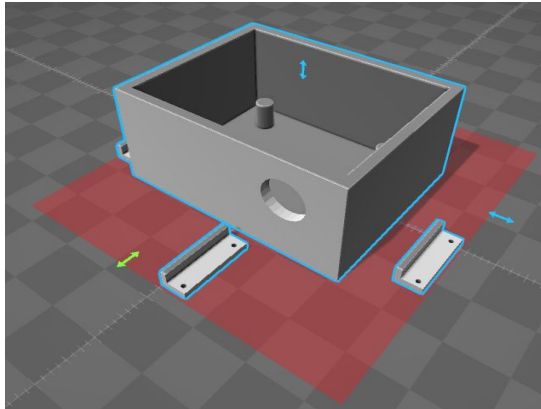
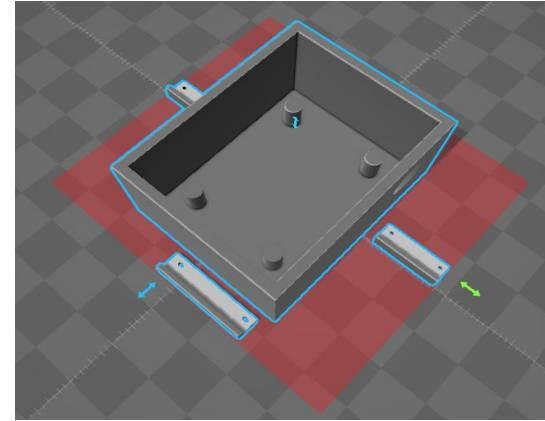
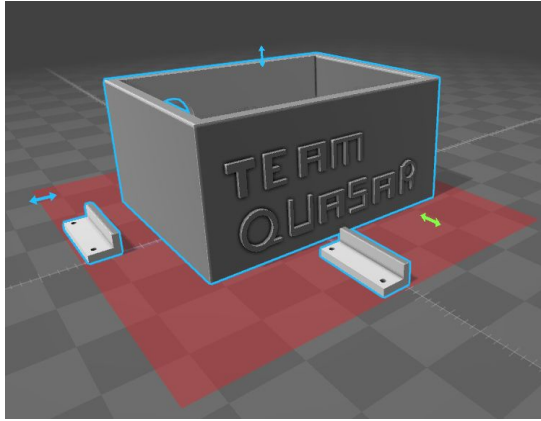
-Loop:

- Construct Packet
  - Get sensor data (poll battery, panel and solar irradiance)
  - Set packet variables to collected data
- Transmit Packet
  - Create payload to transmit
  - Initialize packet
  - Copy collected data to payload
  - Transfer payload
- Clear Packet

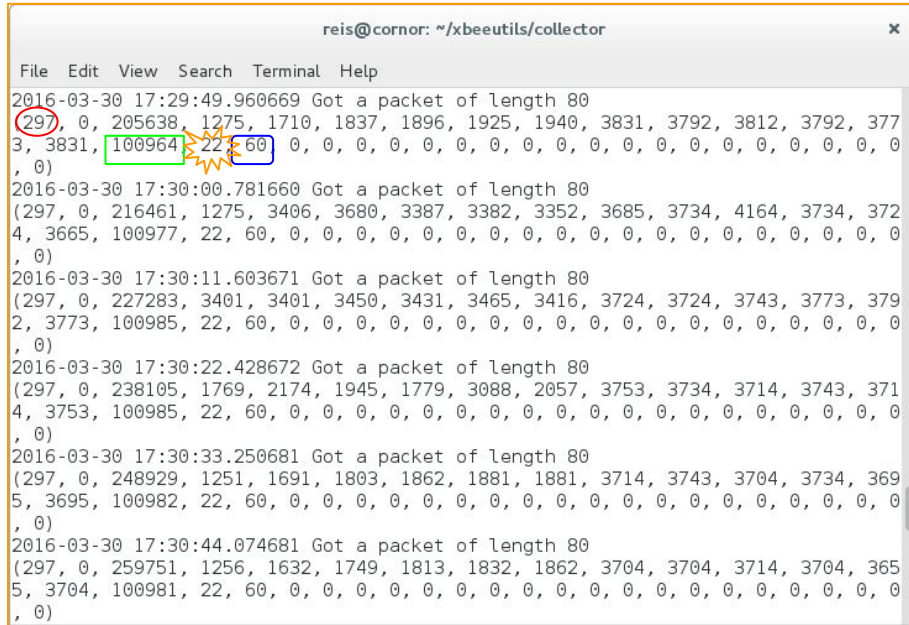
# Progress: PCB Design



# Progress: Housing



# Progress: Code and XBee



The image shows a terminal window titled 'reis@cornor: ~/xbeeutils/collector'. It displays several lines of decoded XBee packet data. The first line is: '2016-03-30 17:29:49.960669 Got a packet of length 80'. Below this, a list of 80 integers is shown. The first integer '297' is circled in red. The 10th integer '100964' is enclosed in a green box. The 11th integer '22' is enclosed in a blue box. A yellow starburst graphic is drawn over the '22' and the '60' that follows it. The subsequent lines show similar packet data at different times: '2016-03-30 17:30:00.781660', '2016-03-30 17:30:11.603671', '2016-03-30 17:30:22.428672', '2016-03-30 17:30:33.250681', and '2016-03-30 17:30:44.074681'. Each line is followed by a list of 80 integers.

Decoded Packet

## •XBee:

-API Mode 2: Arduino and XCTU

## •Transmit Function:

-Poll Solar Irradiance, Battery and Panel

## •Integrated Bare Arduino, Sensors, XBee and Power System

-Checked Data Transmission with the Python Packet Reader



# Encountered Problems

## Code:

- XBee Transmit Function
- Temperature Function
- Packet Schema

## Hardware:

- Eagle PCB Design & Schematic
  - Updated schematics and added new capacitors
  - Battery and Panel Voltage routs to ATMega 328P

## Housing:

- Printing Design
  - Separated panel supports from main box

# Yet to Finish...

- Implement Software Serial
  - Help debug odd panel voltage readings
- Mill PCB
- Soldering
- 3D Printed Housing

# Gantt Chart

		Project								
		(Gantt Chart)								
Week		8	9	10	11	12	13	14	15	
Date		3/14/2016	3/21/2016	3/28/2016	4/4/2016	4/11/2016	4/18/2016	4/25/2016	5/2/2016	5/9/2016
<b>Modules</b>										
	Microprocessor									
	Sensors									
	Charging Circuit									
	Xbee									
<b>Build</b>										
	System Integration									
	Overall System Firmware	Send to microcontroller								
	Design/Print PCB	Schematics	Schematics	PCB Design	Milling					
	Housing			Design	Print Housing	Put together				
<b>Test</b>										
	Debug									
<b>Reports</b>										
	Final Report									

Thank you for listening!

Questions?