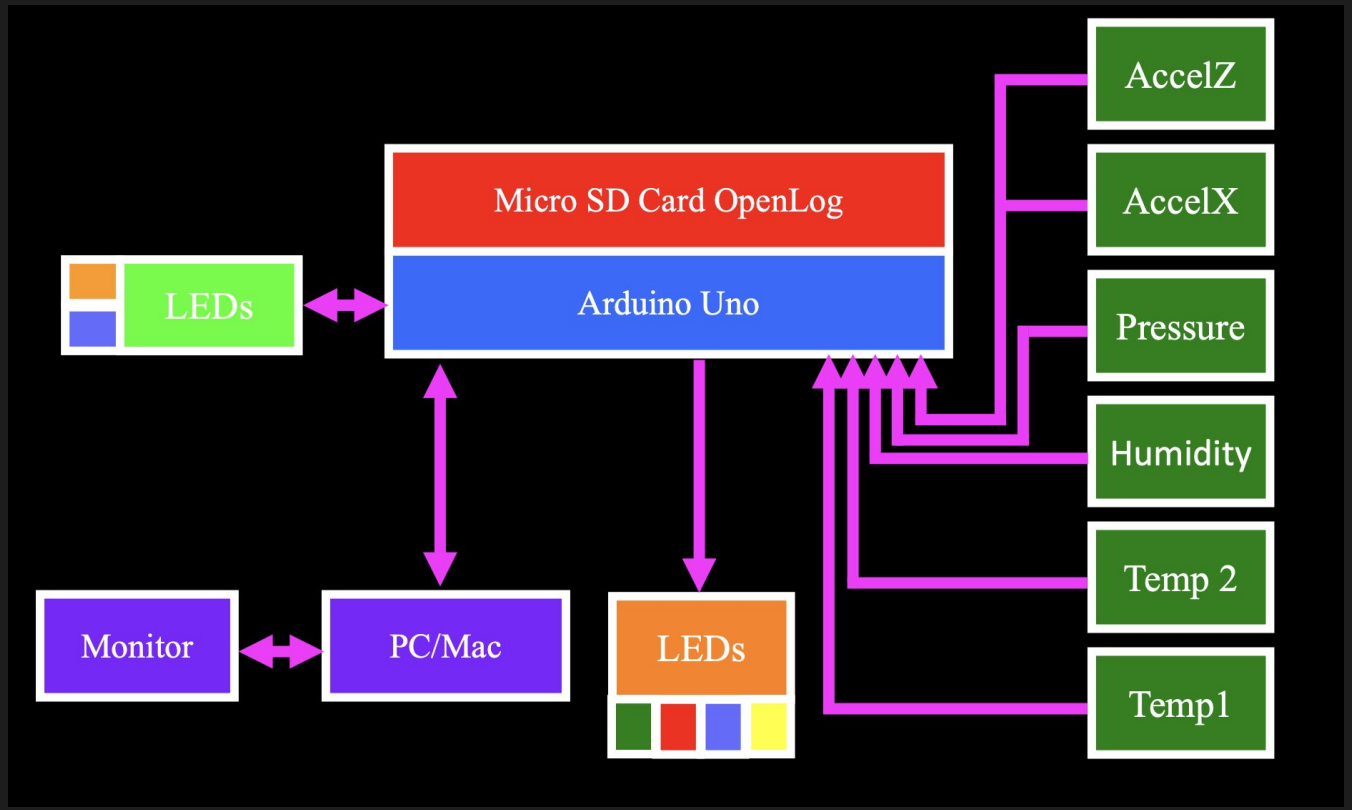
High Altitude Balloon Payload Design

By: Alexis Romo

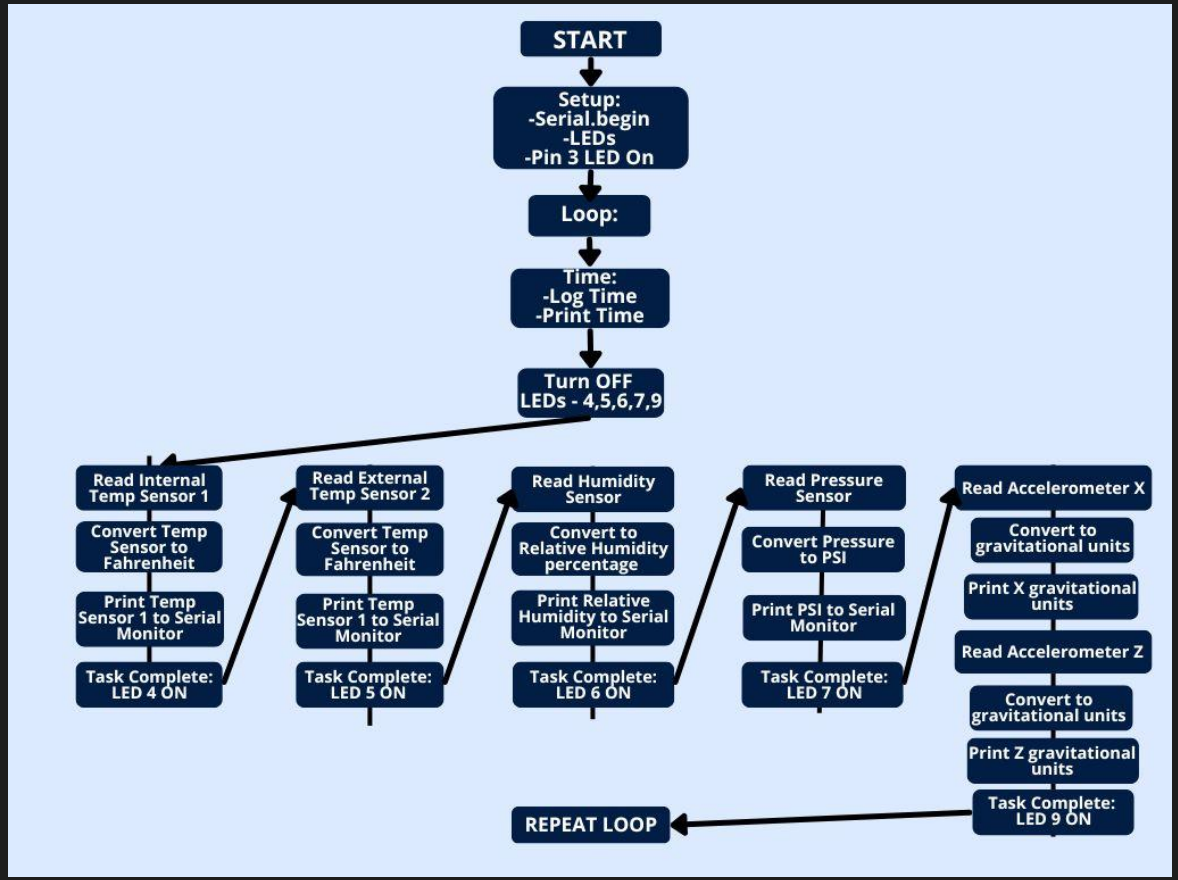
Original System Block Diagram:



Original System Specifications:

1	Components	Cost ($)	Weight (g)	Power Consumption (W)	Links
2	PCB Board	5	12		
3	LEDs (x6)	3.3	3	0.396	https://www.mou
4	330 Ohm Resistors (x6)	0.6	1.2		
5	Humidity Sensor (SEN - 09569)	20.5	0.861	0.01089	https://www.digik
6	Pressure Sensor (015PAAA5)	37.47	1	0.05	https://www.digik
7	Temperature Sensor (TMP36) (x2)	3.2	6	0.00033	https://www.spar
8	Micro SD Card OpenLog	17.5	1.5	0.5	https://www.spar
9	Accelerometer (SEN - 09269)	16.95	4.5	0.00495	https://www.spar
10	Arduino Board	20	25	0.25	https://www.digik
11	6 Pin Socket Header (x2)	0.52	1.5		https://www.digik
12	3 Pin Socket Header	0.21	0.75		https://www.digik
13	16 Pin Headers	0.87	4		https://www.digik
14	DIP Socket	0.22	1		https://www.digik
15	6 Pin Stock Plug Header (x2)	1.38	1.8		https://www.mou
16	8 Pin Stock Plug Header (x2)	1.02	2		https://www.mikr
17	9V Battery	4.46	45		https://www.digik
18	Rocker Switch	0.71	2		https://www.digik
19	Battery Connector	2.95	3.6		https://www.digik
20	TOTALS	$136.86	116.711	1.21217	

Original System Code Flow Chart:



Code Analysis:

```
temp1 = analogRead(A0);
temp1Volt = temp1*(5.0/1023);
temp1C = (temp1Volt - 0.5)/(0.01);
temp1F = (temp1C*(9.0/5.0) + 32);
Serial.print(",");
Serial.print(temp1F, 2);
digitalWrite(4, HIGH);

temp2 = analogRead(A1);
temp2Volt = temp2*(5.0/1023);
temp2C = (temp2Volt - 0.5)/(0.01);
temp2F = (temp2C*(9.0/5.0) + 32);
Serial.print(",");
Serial.print(temp2F, 2);
digitalWrite(5, HIGH);
```

Digital Temperature Sensor:

TSIC™ Digital Semiconductor
Temperature Sensors TSIC 206 / 306

B+B SENSORS

Description

Characteristic features

- Fast response behaviour
- Excellent long term stability
- Accuracy 0.5 / 0.3 K (TSic 206 / 306)
- Wider temperature range 50 ... +150 °C
- Compact housing TO92 / SO8
- Minimum development cost and time
- Simple integration

Typical areas of applications

- Measuring and control systems
- Medical applications
- Temperature monitoring
- Battery operated systems
- Industrial measuring systems

Technical data

Digital Temperature sensors	
Measuring range	-50 ... +150 °C

New System Specifications:

	Components	Cost ($)	Weight (g)	Power Consumption (W)	Links
2	PCB Board	5	12		
3	LEDs (x6)	3.3	3	0.396	https://www.mou
4	330 Ohm Resistors (x6)	0.6	1.2		
5	Humidity Sensor (HIH8120-021-001)	9.38	0.6	0.00325	https://www.digik
6	Pressure Sensor (MPXHZ6250A6U)	14.6	0.5	0.03	https://www.digik
7	Temperature Sensor (TSIC 206) (x2)	12	6	0.00033	https://shop.bb-s
8	Micro SD Card OpenLog	17.5	1.5	0.5	https://www.spar
9	Accelerometer (MPU6050)	6.99	1.5	0.0048	https://www.ama
10	Arduino Board	20	25	0.25	https://www.digik
11	6 Pin Socket Header (x2)	0.52	1.5		https://www.digik
12	3 Pin Socket Header	0.21	0.75		https://www.digik
13	16 Pin Headers	0.87	4		https://www.digik
14	DIP Socket	0.22	1		https://www.digik
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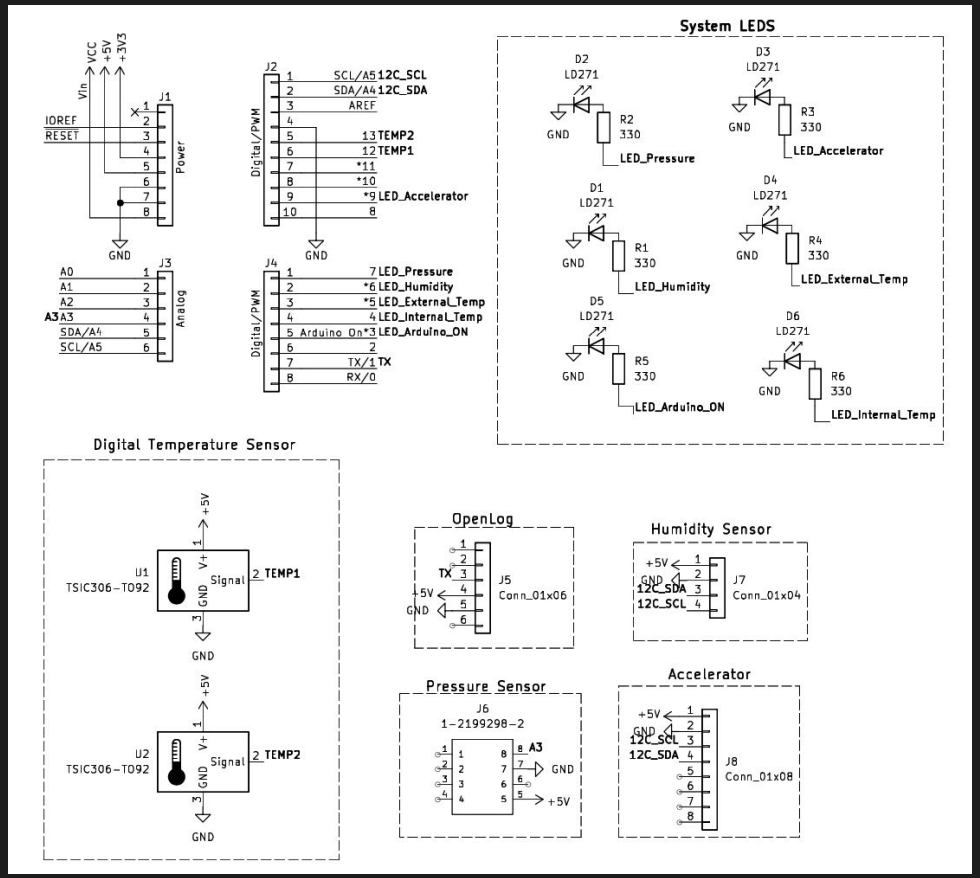
16	8 Pin Stock Plug Header (x2)	1.02	2		https://www.mikr
17	9V Battery	4.46	45		https://www.digik
18	Rocker Switch	0.71	2		https://www.digik
19	Battery Connector	2.95	3.6		https://www.digik
20	TOTALS	$101.71	112.95	1.21217	

New System Schematic:



3D model of New Design: