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Team Number:	204
Project Name:	**ClapSense**
Team Member Names:	**Caleb Yuen**
Version:	**1**

A. List ALL major components (active devices, integrated circuits, etc.) except for

All Major Components	Component Name	Part Number
Microcontroller	PIC18F57Q43 Nano	DM182029
Motor Driver (logic)	TB6612FNG	TB6612FNG
DC Gearmotor (through driver)	DFRobot 6 V Metal Gearmotor	FIT0495-A
Status LEDs (2×)		
Photoresistor (LDR)		
Potentiometer (10 k)		

B. Assign each major component above to ONE power rail below. Try to minimize

+6V Power Rail	Component Name	Part Number
DC Gearmotor (via TB6612 VM)	FIT0495-A	FIT0495-A
c1. Regulator or Source Choice	9 V→6 V buck converter	0930

+5V Power Rail	Component Name	Part Number
Motor Driver (logic)	TB6612FNG	TB6612FNG
c2. Regulator or Source Choice	9 V→5 V buck converter	0930

+3.3V Power Rail	Component Name	Part Number
Microcontroller	PIC18F57Q43 Nano	DM182029
Status LEDs (2×)		
Photoresistor (LDR)		
Potentiometer (10 k)		

c3. Regulator or Source Choice	5 V→3.3 V LDO/buck conver	(full part number)

C. For each power rail above, select a specific voltage regulator using the same pr

D. Select a specific external power source (wall supply or battery) for your system

External Power Source 1	**Component Name**	**Part Number**
Plug-in Wall Supply (Barrel Jack)	AC/DC Adapter Model 0930	0930
Power Rails Connected to External Power Source 1	+6V regulator +5V Regulator +3.3V low-dropout regulator	

External Power Source 2	**Component Name**	**Part Number**
Power Source 2 Selection		
Power Rails Connected to External Power Source 2		

E. Calculate Battery Life (if applicable). For each battery, also check the worst-cas

	Component Name	**Part Number**
	Battery	

Notes

The Master Controller (Hub) subsystem of the ClapSense project uses a 9 V 2 A AC converters. The estimated total current draw is ≈ 0.83 A (1.64 A peak with margin), well the 3.3 V

ower Budget Example

power sources, voltage regulators, resistors, capacitors, or passive element		
SupplyVoltageRange	**#**	**Absolute**
+3.3V	1	50
+5V	1	50
+6V	1	1200
+3.3V	2	20
+3.3V	1	10
+3.3V	1	5

the number of different power rails in the design.		
SupplyVoltageRange	**#**	**AbsoluteMaximumCurrent (mA)**
+6V	1	1200

		Subtotal
		Safety Margin
		Total Current Required on +6V Rail
+8V - 24V in	1	1500
		Total Remaining Current Available on +9V Rail

SupplyVoltageRange	**#**	**AbsoluteMaximumCurrent (mA)**
+5V	1	50

		Subtotal
		Safety Margin
		Total Current Required on +5V Rail
+8V - 24V in	1	1000
		Total Remaining Current Available on +9V Rail

SupplyVoltageRange	**#**	**AbsoluteMaximumCurrent (mA)**
+3.3V	1	50
+3.3V	2	20
+3.3V	1	10
+3.3V	1	5

		Subtotal
		Safety Margin
		Total Current Required on +3.3V Rail
+4.5V - 6V in	1	300
		Total Remaining Current Available on +5V Rail

rocess as for major component selection. Confirm that the Total Remaining C

, and confirm that it can supply all of the regulators for all of the power rails s

SupplyVoltageRange	Output	AbsoluteMaximumCurrent (mA)
100-240 VAC	+9V	2000
	1	750
	1	13
	1	65
		Total Remaining Current Available on External Power Source 1

SupplyVoltageRange	Output	AbsoluteMaximumCurrent (mA)

Total Remaining Current Available on External Power Source 2

se lifetime of the battery by indicating the capacity in mAh.

SupplyVoltageRange	Capacity(mAh)

Battery Life

C/DC wall adapter (Model 0930) as the main source. Power is distributed to 6 V, 5 V
l within adapter limits. The 6 V rail drives the motor and TB6612FNG VM, the 5 V ra
rail powers the PIC18F57Q43 and sensor inputs.

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TotalCurrent(mA)	Unit
25	mA
10	mA
600	mA
20	mA
5	mA
2	mA

TotalCurrent(mA)	Unit
600	mA
	mA
0	mA
0	mA
0	mA
600	mA
25%	
750	mA
1500	mA
750	mA

TotalCurrent(mA)	Unit
10	mA
	mA
0	mA
0	mA
0	mA
10	mA
25%	
12.5	mA
1000	mA
987.5	mA

TotalCurrent(mA)	Unit
25	mA
20	mA
5	mA
2	mA

52	mA
25%	
65	mA
300	mA
235	mA

Current Available on each rail above is

simultaneously. If you need multiple

TotalCurrent(mA)	Unit
2000	mA
750	mA
13	mA
65	mA
1172	mA

TotalCurrent(mA)	Unit
	mA
	mA
0	mA

RequiredByRegulators	
0	
#DIV/0!	hours

/, and 3.3 V rails through dedicated buck
ail handles logic and power conversion, and