Power Budget Example

Team Number:	204
Project Name:	**ClapSense**
Team Member Names:	**Caleb Yuen**
Version:	**2**

A. List ALL major components (active devices, integrated circuits, etc.) except for power sources, voltage regulators, resistors, capacitors, or passive elements

All Major Components	Component Name	Part Number	SupplyVoltageRange	#	Absolute	TotalCurrent(mA)	Unit
Microcontroller	PIC18F57Q43 Nano	DM182029	+5V	1	50	25	mA
Motor Driver (logic)	FAN8100N	FAN8100N	+5V	1	50	10	mA
DC Gearmotor (through driver)	DFRobot 6 V Metal Gearmotor	FIT0495-A	5-6V	1	1200	600	mA
Status LEDs			+5V	1	20	20	mA

B. Assign each major component above to ONE power rail below. Try to minimize the number of different power rails in the design.

+6V Power Rail	Component Name	Part Number	SupplyVoltageRange	#	AbsoluteMaximumCurrent (mA)	TotalCurrent(mA)	Unit
							mA
							mA
						0	mA
						0	mA
						0	mA
					Subtotal	0	mA
					Safety Margin	25%	
					Total Current Required on +6V Rail	0	mA
c1. Regulator or Source Choice							mA
					Total Remaining Current Available on +9V Rail	0	mA

+5V Power Rail	Component Name	Part Number	SupplyVoltageRange	#	AbsoluteMaximumCurrent (mA)	TotalCurrent(mA)	Unit
Microcontroller	PIC18F57Q43 Nano	DM182029	+5V	1	50	25	mA
Motor Driver (logic)	FAN8100N	FAN8100N	+5V	1	50	10	mA
DC Gearmotor (through driver)	DFRobot 6 V Metal Gearmotor	FIT0495-A	5-6V	1	1200	600	mA
Status LEDs			+5V	1	20	20	mA
							mA
					Subtotal	655	mA
					Safety Margin	25%	
					Total Current Required on +5V Rail	818.75	mA
c2. Regulator or Source Choice	N/A				0	820	mA
					Total Remaining Current Available on +9V Rail	1.25	mA

+3.3V Power Rail	Component Name	Part Number	SupplyVoltageRange	#	AbsoluteMaximumCurrent (mA)	TotalCurrent(mA)	Unit
							mA
							mA
							mA
							mA
					Subtotal	0	mA
					Safety Margin	25%	
					Total Current Required on +3.3V Rail	0	mA
c3. Regulator or Source Choice							mA
					Total Remaining Current Available on +5V Rail	0	mA

C. For each power rail above, select a specific voltage regulator using the same process as for major component selection. Confirm that the Total Remaining Current Available on each rail above is

D. Select a specific external power source (wall supply or battery) for your system, and confirm that it can supply all of the regulators for all of the power rails simultaneously. If you need multiple

External Power Source 1	Component Name	Part Number	SupplyVoltageRange	Output	AbsoluteMaximumCurrent (mA)	TotalCurrent(mA)	Unit
Plug-in Wall Supply (Barrel Jack)	AC/DC Adapter Model 0930	0930	100-240 VAC	+9V	2000	820	mA
							mA
Power Rails Connected to External Power Source 1							mA
							mA
					Total Remaining Current Available on External Power Source 1	820	mA

External Power Source 2	Component Name	Part Number	SupplyVoltageRange	Output	AbsoluteMaximumCurrent (mA)	TotalCurrent(mA)	Unit
Power Source 2 Selection							mA
							mA
Power Rails Connected to External Power Source 2							
					Total Remaining Current Available on External Power Source 2	0	mA

E. Calculate Battery Life (if applicable). For each battery, also check the worst-case lifetime of the battery by indicating the capacity in mAh.

	Component Name	Part Number	SupplyVoltageRange	Capacity(mAh)	RequiredByRegulators	
	Battery				0	
				Battery Life	#DIV/0!	hours

Notes

The Master Controller (Hub) subsystem of the ClapSense project uses a 9 V, 2 A AC/DC wall adapter (Model 0930) as the main source. On the hub PCB, a single LM7805 linear regulator converts 9 V to a 5 V system rail. This 5 V rail powers the PIC18F57Q43 Curiosity Nano, the FAN8100N motor driver, the DFRobot 6 V metal gearmotor (operated at 5 V), and the status LEDs. The worst-case current on the 5 V rail is approximately 0.66 A; with a 25% design margin this becomes about 0.82 A, which is within both the LM7805's 1 A rating and the 2 A rating of the wall adapter.