**Power Budget** 

Team Number:	206			[			
Project Name:	Modular Motion-and-light sensing of	control subsystem		1			
Team Member Names:	Adrian Perez, Zane Brauer			1			
Version:				1			
	1			1			
A. List ALL major components	s (active devices, integrated circ	uits, etc.) except for powe	er sources, voltage reg	ulators, r	esistors, capac	itors, or passi	ve
All Major Components	Component Name	Part Number	Supply	#	Absolute	Total	Unit
•	Curiosity Nano (PIC18F57Q43 board)	PIC18F57Q43	1.8V to 5.5V	1	50	50	mA
	Motor Driver	TB6612FNG	2.7V - 5.5V	1	50	50	mA
	DC Motor (Gearmotor)	Pololu 37D 12V DC	12V	1	5500	5500	mA
	Ambient Light Sensor	LTR-329ALS-01	2.4V to 3.6V	1	1	1	mA
	PIR Motion Sensor	LS6501LP	11V - 25V	1	1		mA
		TLV2372IDR	2.7V to 16V	1	1		mA
	Operational Amplifier				=		
	Pushbutton Switch	Omron B3F	Rated upto 24V	1	0		mA
	Indicator LED	WP710A10ND	2V (forward voltage)	1	10	10	mA
B. Assign each major compon +12V Power Rail	ent above to ONE power rail below Component Name	<u>ow. Try to minimize the n</u> Part Number	umber of different pow Supply	<u>er rails ir</u> #	n the design. Absolute	Total	Unit
- 120 T GWGI Tian	DC Motor (Gearmotor)	Pololu 37D 12V DC	12V	1	5500	5500	
	PIR Motion Sensor	LS6501LP	11V - 25V	1	1		mA
	PIR MOLION Sensor	LSGSUILP	110 - 250	1	1		
							mA
						0	mA
						0	mA
					Subtotal	5501	mΑ
							1
			T. (-1.5	D- '	Safety Margin	25%	A
			Total Current	Required	ı on +12V Rail	6876.25	mA
c1. Regulator or Source Choic	External 12V, 10A SMPS	Mean Well LRS-100-12	12V	1	8500	8500	mA
-		То	tal Remaining Current	Available	on +12V Rail	1623.75	mA
+5V Power Rail	Component Name	Part Number	Supply	#	Absolute	Total	Unit
	Curiosity Nano (MCU board)	PIC18F57Q43	1.8V to 5.5V	1	50		mA
		<u>-</u>					
	Motor Driver	TB6612FNG	2.7V - 5.5V	1	50		mA
	Operational Amplifier	TLV2372IDR	2.7V to 16V	1	1	1	mA
	Indicator LED	WP710A10ND	2V (forward voltage)	1	10	10	mA
	Pushbutton	Omron B3F	Rated upto 24V	1	0	0	mA
	Tushibutton	31111311 <u>23</u> 1	nated apto 217	-	ا	ĭ	
					Culturatural	111	m A
					Subtotal	111	MA
					Safety Margin	25%	
			Total Curren	t Require	ed on +5V Rail	138.75	mA
				•			
c2. Regulator or Source Choic	+5V Regulator	Pololu \$12\/1EEE	2.8V - 22V	1	1500	1500	mΛ
L. Regulator or Source Choic	TOV REGUIATOI	Pololu S13V15F5				1500	
	_		otal Remaining Current			1361.25	
+3.3V Power Rail	Component Name	Part Number	Supply	#	Absolute	Total	Unit
	Ambient light Sensor (I^2C)	LTR-329ALS-01	+2.4 - 3.6V	1	1	1	mA
						0	mA
						٥	mA
							mA
					Subtotal		mA
					Safety Margin	25%	
			Total Current l	Required	on +3.3V Rail	1.25	mA
o? Bosulator or Source Chain	. 12.2\/ low drapout regulator	VA70D1422DTF	+5V - 20V	1	F00	F00	mΛ
c3. Regulator or Source Choic	+3.3v low-dropout regulator	KA78RM33RTF		_	500	500	
		10	otal Remaining Current	Availabi	e on 3.3V Rail	498.75	mA
C. For each power rail above.	select a specific voltage regulate	or using the same proces	s as for maior compon	ent selec	tion. Confirm th	hat the Total R	emaining
<b>Rail</b> +12V Power Rail	External 12V. 10A SMPS	Part Number Mean Well LRS-100-12	Supply 12V	1	Absolute 8500	Total 1	Unit mA
+5V Power Rail	+5V Regulator	Pololu S13V15F5	2.8V - 22V	1	1500	1500	
	•						
+3.3V Power Rail	+3.3V low-dropout regulator	KA78RM33RTF	+5V - 20V	1	500	500	ıπA
					Subtotal	2001	mA
D. Select a specific external pro-	ower source (wall supply or batte	erv) for your system, and	confirm that it can sur	ply all of	the regulators	for all of the n	ower rails
External Power Source 1	Component Name	Part Number	Supply	Output	Absolute	Total	Unit
Power Source 1 Selection	Plug-in Wall Supply	Mean Well GST25A24-P		+24V	5000	5000	
. Ower Cource i Selection	i lag-iii vvali Guppiy	WCair Well GOTZOAZ4-P	10 1100740	· 47 V	3000	3000	111/7
	. 4014	1.1.70.40					
Power Rails Connected to	+12V regulator	LM7812	+12V - 35V	+12V	1000	1000	mA
	+5V Regulator	LM7805	+7V - 25V	+5V	1000	1000	mA
External Power Source 1	+3.3V low-dropout regulator	KA78RM33RTF	+5V - 20V	+3.3V	500	500	
	5.5 Ton aropout regulator		. O V ZO V	. J.J V	300	500	
		Total Remaining (	Current Available on Ex	ternal Pr	ower Source 1	2500	mA
		. Juli Kemanniy	one , transport on LA		or Jource 1	2500	
External Power Source 2	Component Name	Part Number	Supply	Output	Absolute	Total	Unit
Power Source 2 Selection	Battery	Duracell MN1604 (9V)	+9V	+-9V	500	500	mA
		. ,					
	-5V Regulator	LM7905	-8V25V	-5V	500	500	mA
Power Rails Connected to	OV INEGUIATOR	LIVI7 300	-0v20v	-J v	500	500	111/1
External Power Source 2					ı	I	
External Power Source 2							
External Power Source 2		Total Remaining (	Current Available on Ex	ternal Po	wer Source 2	500	mA
External Power Source 2		Total Remaining (	Current Available on Ex	ternal Po	ower Source 2	500	mA
External Power Source 2  Notes		Total Remaining (	Current Available on Ex	ternal Po	ower Source 2	500	mA

External Supply Voltage should be determined by the dropout voltage for highest-voltage regulator (e.g., +14V for a +12V regulator). If you have multiple units in your design (e.g., a base unit and remote unit) then you need a separate power budget for each unit