

Actuator Subsystem Power Budget

Team Number:	204					
Project Name	Actuator Subsystem					
Team Member	Jacob Wilson					
Version:	1.0					

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

Major Component Name	Part Number	Supply Voltage Range	#	Absolute Maximum Current (mA)	Total Current (mA)	Unit
	Geared DC Motor	1738-1417-ND	+4-6 V	2	150	300 mA
	H-Bridge Driver	2156-FAN8100M	+2-9V	2	20	40 mA
	ESP32 WROOM	CY8CKIT-142	3.3-3.6V	1	60	60 mA
	9V Battery Supply		9-0V	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.

Add additional power rails or change the power rail voltages if needed.

+9V Power Rail Component Name	Part Number	Supply Voltage Range	#	Absolute Maximum Current (mA)	Total Current (mA)	Unit
	Geared DC Motor	1738-1417-ND	+4-6 V	2	300	600 mA
	9V DC Battery Supply		9V	1	1000	1000 mA
					0	0 mA
					0	0 mA
					0	0 mA

					Subtotal	600	mA
					Safety Margin	25%	
					Total Current Required on +9V Rail	750	mA
c1. Regulator	9 Volt Battery	PRT-00119	+9V	1	2000	2000	mA
					Total Remaining Current Available on +9V Rail	1250	mA
+3.3V Power		Component Name	Part Number	Supply Voltage Range	#	Absolute Maximum Current (mA)	Total Current (mA)
							Unit
	ESP32 WROOM	surface mount	3.3-3.6	1	60	60	mA
						0	mA
						0	mA
	H-Bridge Driver (Logic)	2156-FAN8100M	+3-5V	1	20	20	mA
	H-Bridge Driver (Logic)	497-2936-5-ND	3-5V	1	20	20	mA
					Subtotal	100	mA
					Safety Margin	25%	
					Total Current Required on +5V Rail	125	mA
c2. Regulator	+5V Regulator	LM7805	+5V - 35V	1	1500	1500	mA
					Total Remaining Current Available on +5V Rail	1375	mA

<i>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 power sources, list each separately below and indicate which regulators will be connected to each supply. Confirm that the Total Remaining Current Available on each power source below is not negative.</i>							
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External Power Component Name			Part Number	Supply Voltage Range	Output Voltage	Absolute Maximum Current (mA)	Total Current (mA)	Unit
Power Source	9 Volt Battery	PRT-00119	+9V	+9V	2000	2000	mA	
Connected to External Power Source 1								
	+5V Regulator	LM7805	+5V - 35V	1	1500	1500	mA	
	Total Remaining Current Available on External Power Source 1					500	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	Supply Voltage Range		Capacity (mAh)	Required By Regulators		
	9 Volt Battery	PRT-00119	+9V		600	1000		
			Battery Life (At Maximum Current Draw)			0.6	hours	