

Feasibility Testing Proposal – Power Source Testing

Team: P15001: Active Ankle Foot Orthotic

Engineer: Jared Green – Mechanical Engineer

Related System: Recharge or Replace Battery

In order to decide what power source to use, circuit distribution needs to be analyzed. Factors of a power source selection include cost, capacity (which factor into size and weight), and hours used per discharge before having to replace or recharge the power source.

Testing Plan

For the rechargeable batteries, test plans include charging the batteries over certain time to determine how long they take to charge. For all the batteries, the battery discharge rate can be calculated using the current each component takes to run. The calculated current can then be used to identify a typical battery discharge used for running the system which will ultimately determine the total battery life and the ideal power source to use.

Start Date: 9/22/2014

End Date: 10/15/2014

Budget

Equipment	Price	Quantity
None		
Total:		

Battery Type	AA	AA	D	D	9v	9v	7.4 v	6V
Rechargeable?	no	yes	no	yes	no	yes	Yes	Yes
Weight per battery (g)	23	30	144.0	73.0	45.6	41	266	810
Volume per battery (cm ³)	8.1	8.3	56.0	56.5	21.1	21.7	19 x 109 x 70 mm	165 x 33 x 65 mm
Nominal Voltage (V)	1.5	1.2	1.5	1.2	9	8.4	7.4	6
Typical battery discharge (mA)	500	530	500	500	500	35		
Battery life (mAh)	1500	2650	~10000	2500	~375	175	7800	10000
Specific energy (watt-hours/kg)	97.82609	106	104.1667	41.09589	74.01316	35.85366	216.9925	74.07407
Cost	Varies	Varies	Varies	Varies	Varies	Varies	\$65.00	\$69.99

Data Sheet references

<http://www.batteryholders.org/9v-alkaline.pdf>

<http://data.energizer.com/PDFs/E91.pdf>

http://data.energizer.com/PDFs/HR6-2650_EU.pdf

<http://data.energizer.com/PDFs/522.pdf>

http://data.energizer.com/PDFs/HR22-175_EU.pdf

http://data.energizer.com/PDFs/HR20-2500_EU.pdf

<http://data.energizer.com/PDFs/e95.pdf>

<http://www.tenergy.com/31031>

http://www.all-battery.com/li-ion1865074v7800mahflatrechargeablebattery modulewithpcb andbareleadscustomize.aspx?utm_source=GoogleShopping&utm_medium=GDF&gdftrk=gdfV26767_a_7c354_a_7c922_a_7c31031&gclid=CNuYx6W698ACFQto7AodgVIANw

<http://www.onlybatteries.com/showitem.asp?ItemID=18522>