

SOLAR POWERED BACKPACK UNIT

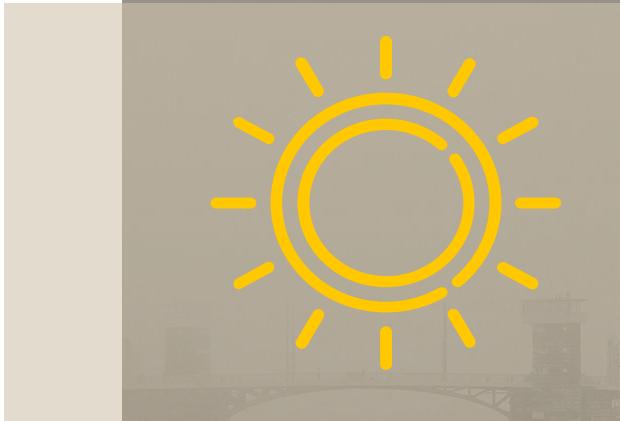
Group 10

Rawsen Mitchell, Alex Kim, Landen Smith, Ethan Grandfield,
Tom Turner, Roberto Fernandez



PROJECT TEAM

- Rawsen Mitchell | Project manager | MechE
- Alex Kim | Builder/Visionary | MechE
- Landen Smith | Builder | MechE
- Ethan Grandfield | Builder | CompE
- Tom Turner | Builder | MechE
- Roberto Fernandez | Timer | MechE



PROBLEM STATEMENTS AND CONSTRAINTS

PROBLEM STATEMENT

The unit must charge a mobile device/power bank and remain under budget. It should also be minimal and effective, allowing the unit to be modular and accessible.

IMPLICIT CONSTRAINTS

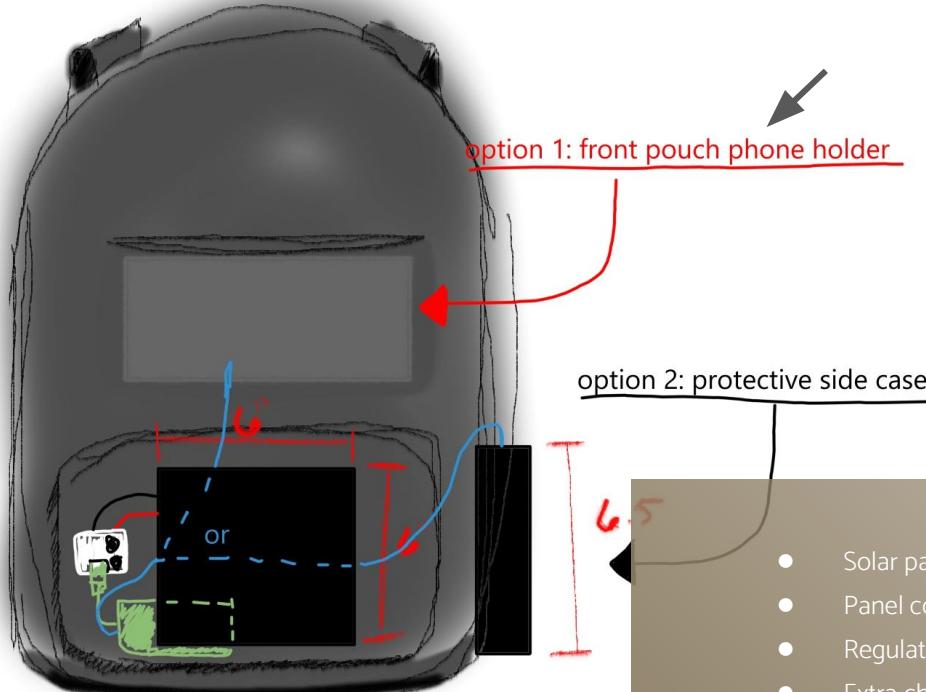
- Plastics must measure correctly
- Soldering must be done safely
- Unit must fit within backpack pouches

EXPLICIT CONSTRAINTS

- Assembled and tested in class
- adheres to safety requirements
- <2'x3'x3' (WxLxH)
- <\$50 budget

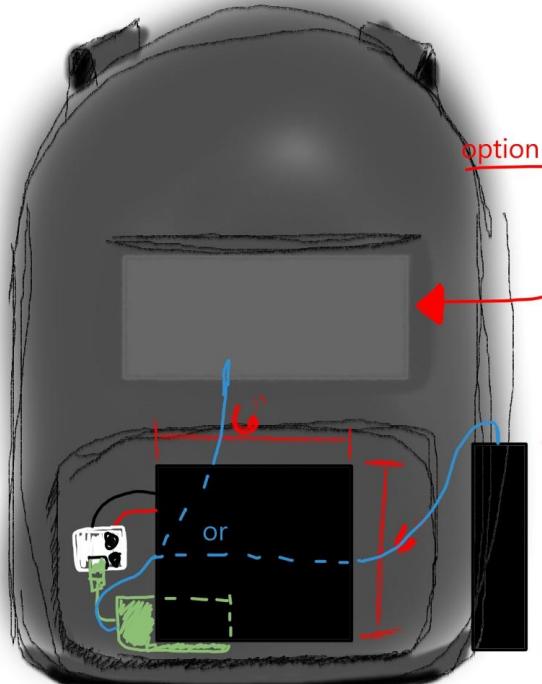
HOW DO WE PLAN TO ACHIEVE THIS?

OPTION 1



- Solar panel fits on front
- Panel connected to regulator
- Regulator connected to power bank
- Extra charger leads into top front pouch

Option 2

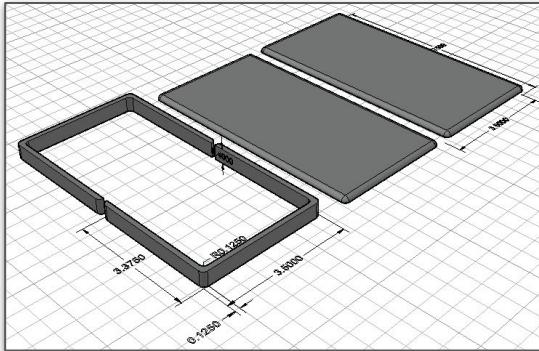


option 1: front pouch phone holder

option 2: protective side case

6.5

- Solar panel fits on front
- Panel connected to regulator
- Regulator connected to power bank
- Extra charger leads to outer right of the backpack into an external phone holster



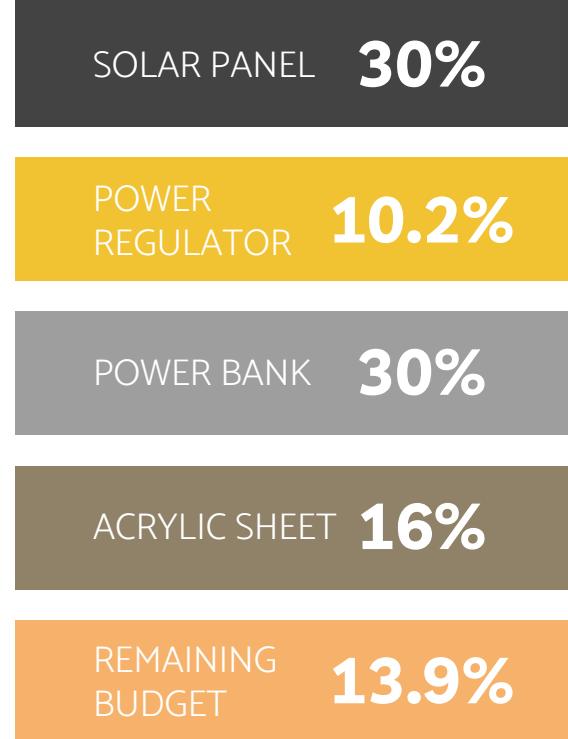
SELECTION MATRIX

Option	Evaluation Criteria						Weighted Score
	Cost	Functionality	Demographic availability	Ease of Construction	Modularity	Appearance	
	3	1	2	2	1	1	
Design 2	2	2	1	1.5	2	1	16
Design 1	4	3	1	3.5	4.5	3	31.5
	Scale 1-5 (1 being most desirable)						

Overall...

Design 2 proved to be:

- less or equal in money
- more modular
- more accessible



BUDGET

If you want to modify this graph, click on it, follow the link,
change the data and replace it

DECISION/DESIGN ANALYSIS



DESIGN

- Phone case outside of bag provides easy-access to mobile devices
- Front pouch of bag holds electronics well
- Battery packs store charge

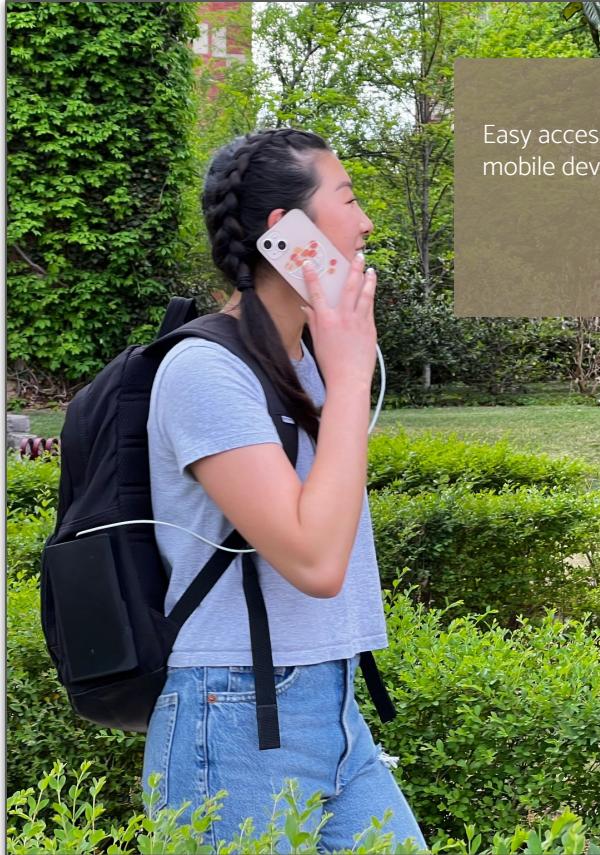


DECISION

Proceeded with Design 2 because...

- Phone case on outside provides easy-access
- Easier to build

PICTURES

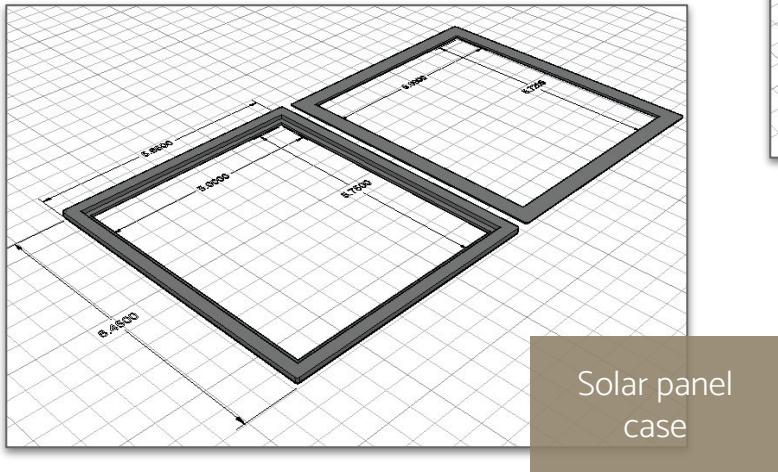
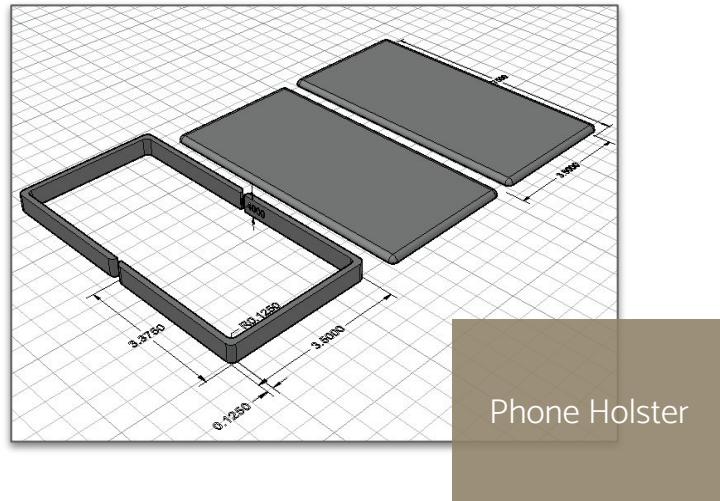
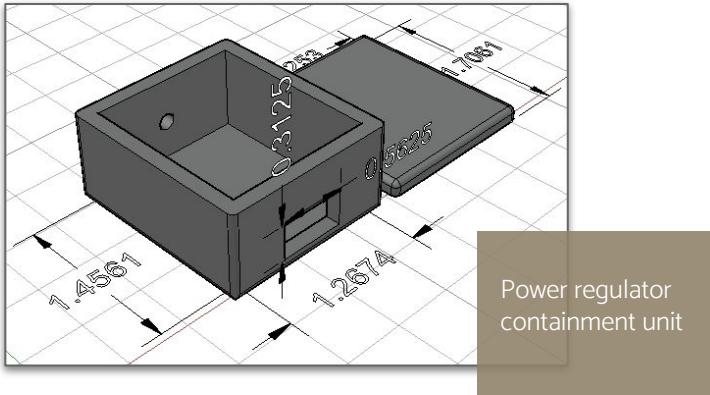


Easy access to
mobile devices



Charger can be
swapped for
other devices

PICTURES



PICTURES



PROJECT CONTROLS

ESTIMATED COST



- \$43.06

ACTUAL COST



- \$43.06

PERFORMANCE SUMMARY

- Lots of prep-work before build day. Overall, successful
- Things to do differently:
 - Find more efficient parts, better backpack, more customization options.

ESTIMATED TIME



- Assembly: 5 minutes

ACTUAL TIME



- Assembly: 1 minute and 45 seconds

THANKS

