



Robotics Traveling Van - 2nd Hardware Status Update

67% Milestone Check-in

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2/26/26

Gantt Chart & Schedule

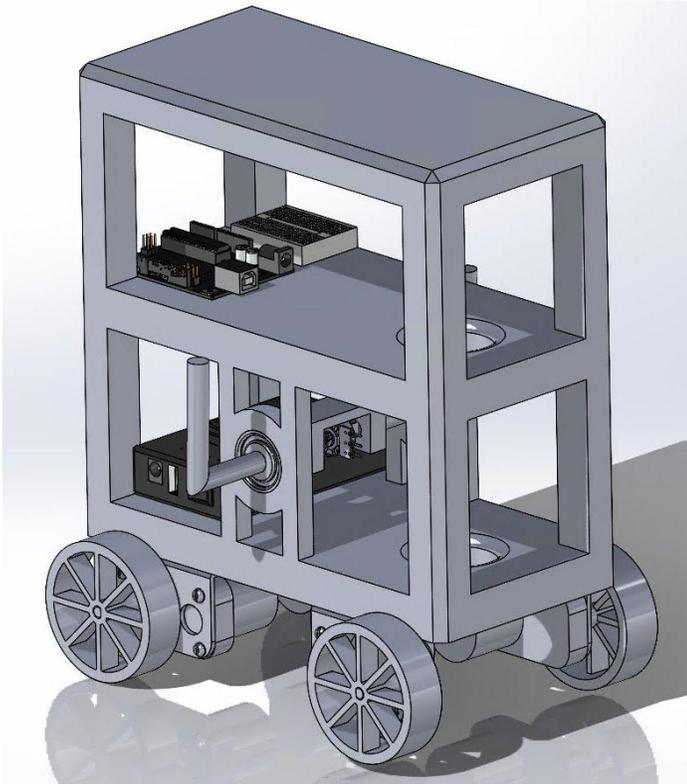
- 1) Client demo in March
- 2) 2 weeks of backlog in orders
- 3) Misprints due to tolerances being too tight
- 4) Overall, lost our lead, now slightly behind due to missing rods and filament.

A	B	AC	AD	AE	AF	AG	AH	AI	AJ	AK
Month	Assignment Name	Feb 23	Feb 26	Feb 27	Mar 3	Mar 5	Mar 6	Mar 16	Mar 19	Mar 20
	Staff Meeting #4 (Wk5)									
	Timecard Wk5									
	Staff Meeting #5 (Wk6)									
	Website Check #1									
	Timecard Wk6									
	Hardware Status Update (67%)									
	Peer Eval 2									
Mar	CLIENT DEMO									
	Staff Meeting #6 (Wk8)									
	UGRADs Registration									
	Timecard Wk8									
	Staff Meeting #7 (Wk9)									
	Finalized Testing Plan									
	Timecard Wk 9									
	Hardware Status (100% build)									
	Draft of Poster									
	Peer Eval 3									

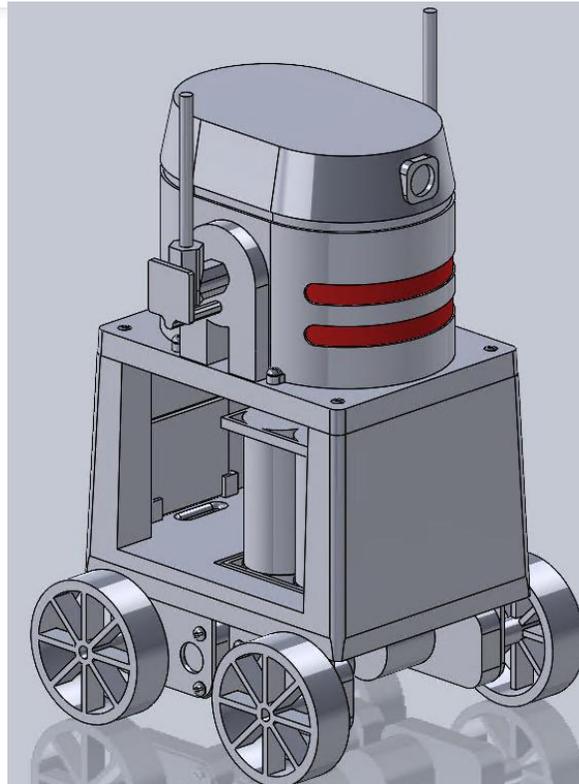
* No orders allowed 02.11 - 02.26
2 weeks of delay in printing

* Misprints and tolerances
Down units for final 5

Design Efforts - Robot 1 (Inverted Pendulum)



December 2025



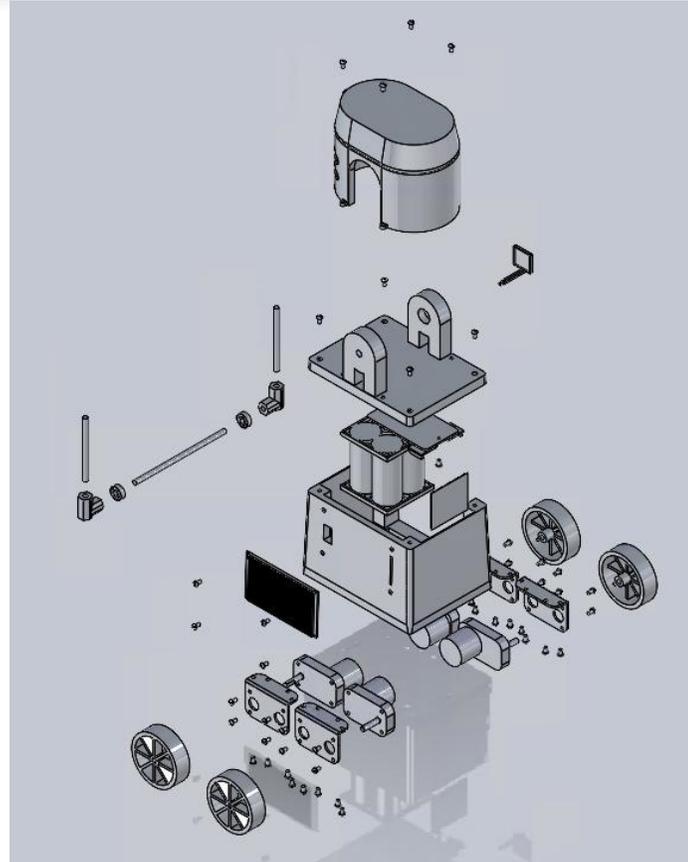
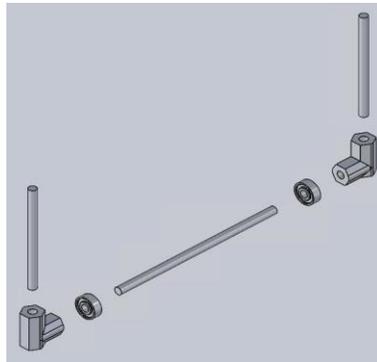
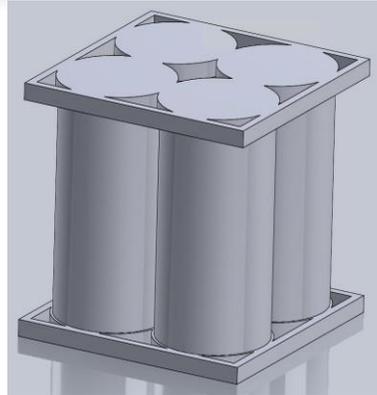
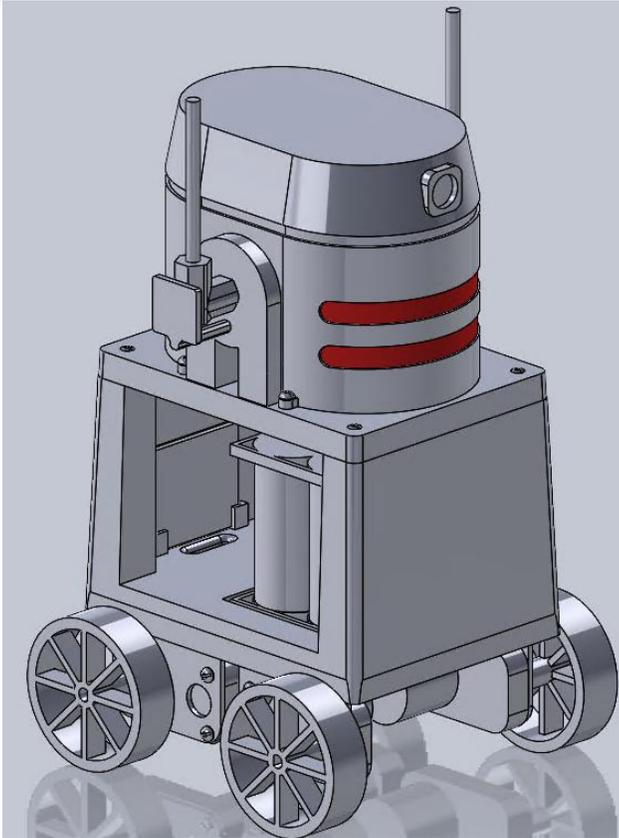
February 2026

- Frame Completely Overhauled, Almost all electrical components now mounted on single level
- Switched from Arduino to Raspberry-Pi control system
- Battery system custom built.
- Switched to Magnetic Potentiometer
- Pendulum arm moved up, rebuilt to accommodate magnetic potentiometer
- Overall more aesthetically pleasing

Design Efforts - Robot 1 (Inverted Pendulum)

- Design mistakes revealed in testing
- 1) steel vs. alum
- 2) weak arm bracket w/ no radial stop
- 3) protoboard screw holes covered
- 4) tolerances too tight ~

Robot 1 Updated CAD



- Frame Separated into 2 pieces - Vastly Improves Print Quality
- Pendulum Arm separated into 3 pieces, printed angled brackets to ensure precise angle.
- Mounts for electrical Components added to both halves of frame
- Divit added to bottom frame + holes to secure battery pack with zip-ties.

RTV - Colin

3/3/2026

Purchasing Plan - Robot 1

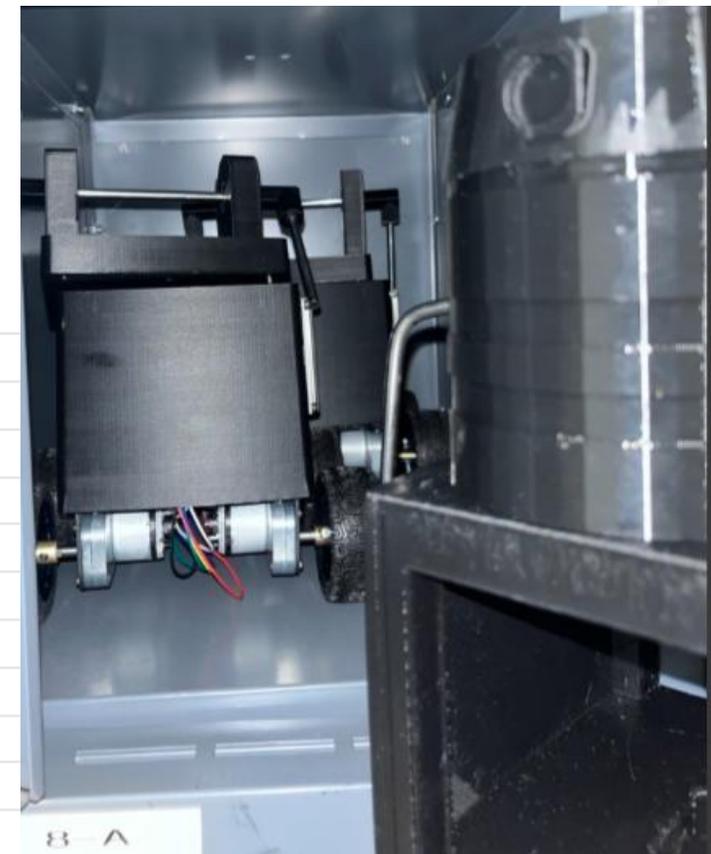
- 1) We have a hold on ordering parts until project lead acknowledges
- 2) Almost all electrical components, missing PLA for prints
- 3) 14 day backlog, 4 day lead time, 3-5 day print time

5 Unit BOM		Purchased	In Stock	Cost		
Mech	20 motors	40% on hold	40%	49.95		
	20 wheels	80% on hold	80%	-		
	10 bearings	100%	100%	8.49		
	5 Al rods	0% on hold	0%	11.99		
	3kg filament	20% on hold	0%	22.99		Total Budget
	100 screws	100%	100%	21.99	Spent	\$5,000
	100 M3 long	100%	100%	9.49	Remaining	\$925.68
	100 M3 short	100%	100%	9.99		
	Electrical	5 PicoPi	100%	100%	12.99	
	5 protoboard	100%	100%	5.99		
	5 buck converter	100%	100%	8.69		
	10 motor drivers	100%	100%	25.98		
	# wire	100%	100%	9.99		
	20 batteries	80% on hold	80%	159.95		
	5 chargers	100%	100%	72.95		
	5 mag. encoders	100%	100%	44.95		
	5 BMS	100%	100%	44.95		
	5 power cords	100%	100%	49.95		
UI	5 Touchscreen	80% on hold	80%	104.95		
	% total	85% % total	84%			

01/30 order sent & received
 02/10 order denied
 Notified team
 02/23

**85% on hand/purchased
 100% on hold!**

Manufacturing Plan - Robot 1

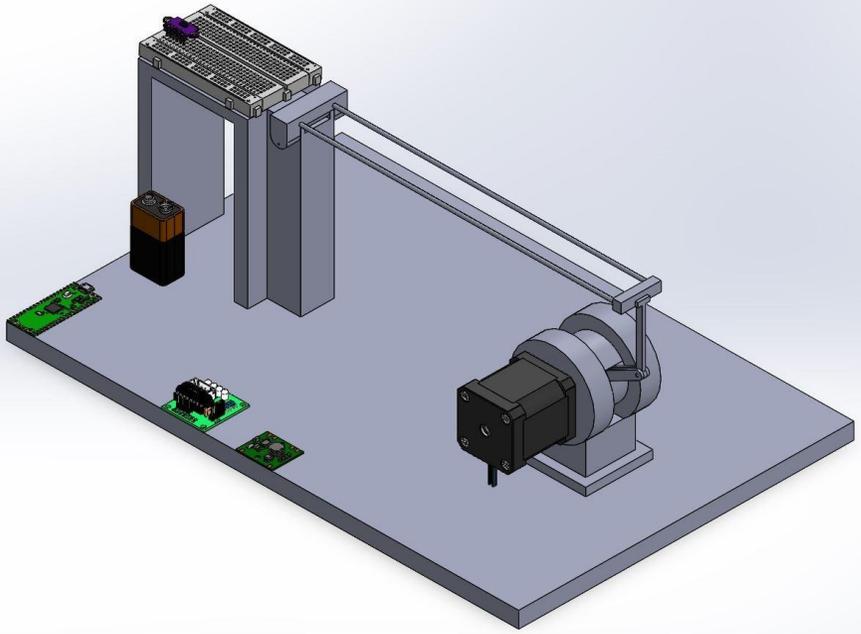


Numbers for 5 unit total count (20% = 1 robot)

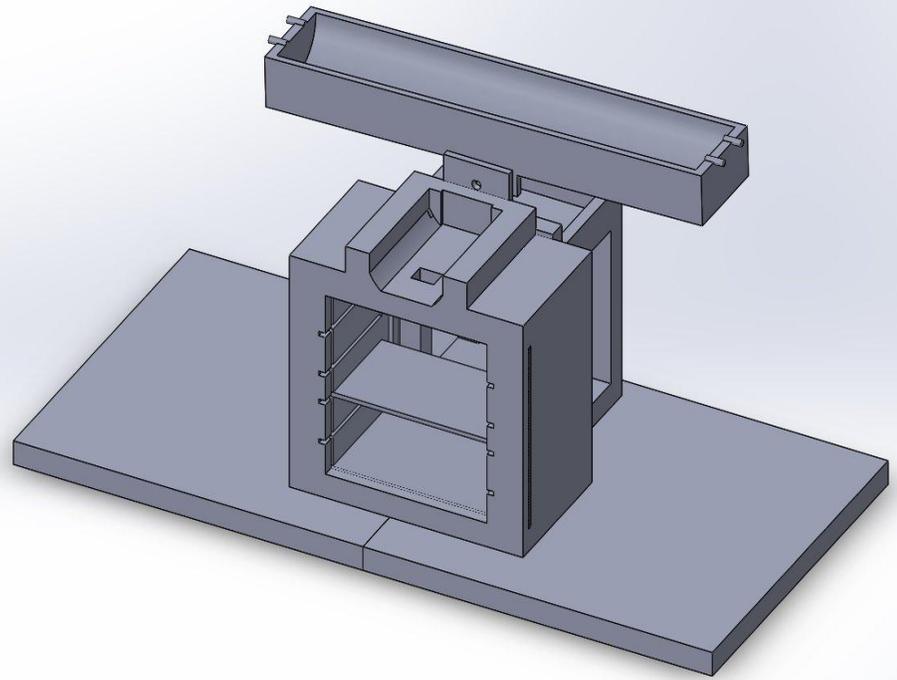
		Status	Unit Time	5 Units Time	TOTAL:
Parts Printed					73%
Frame	top/bottom	60%	54 hrs/each	326 hrs	Note: 10 hrs of print from IDEALab for TPU shell
	arm bracket	60%	6 hrs/per 12	6 hrs	
	mag. holder	100%	8 hrs/per 8	8 hrs	
	shells	100%			
Parts Machined					40%
Pendulum		40%	1hr/each	5 hrs	(moved from bending to cutting)
Units Assembled					40%
Robot 1		40%	1.5 hrs/each	7.5 hrs	Note: Only includes mechanical assembly and circuit mounting, NOT circuit soldering (~3 hrs each)
If electrical included, total assembly time for 5 units is ~22.5 hrs					

- 1) 3/5 frames (top & bottom) + 5/5 shells + 2/5 circuits + 5/5 smaller parts (brackets, electrical holders)
- 2) Over all ~ 71% manufactured

Design Efforts - Robot 2 (Ball-on-Beam)



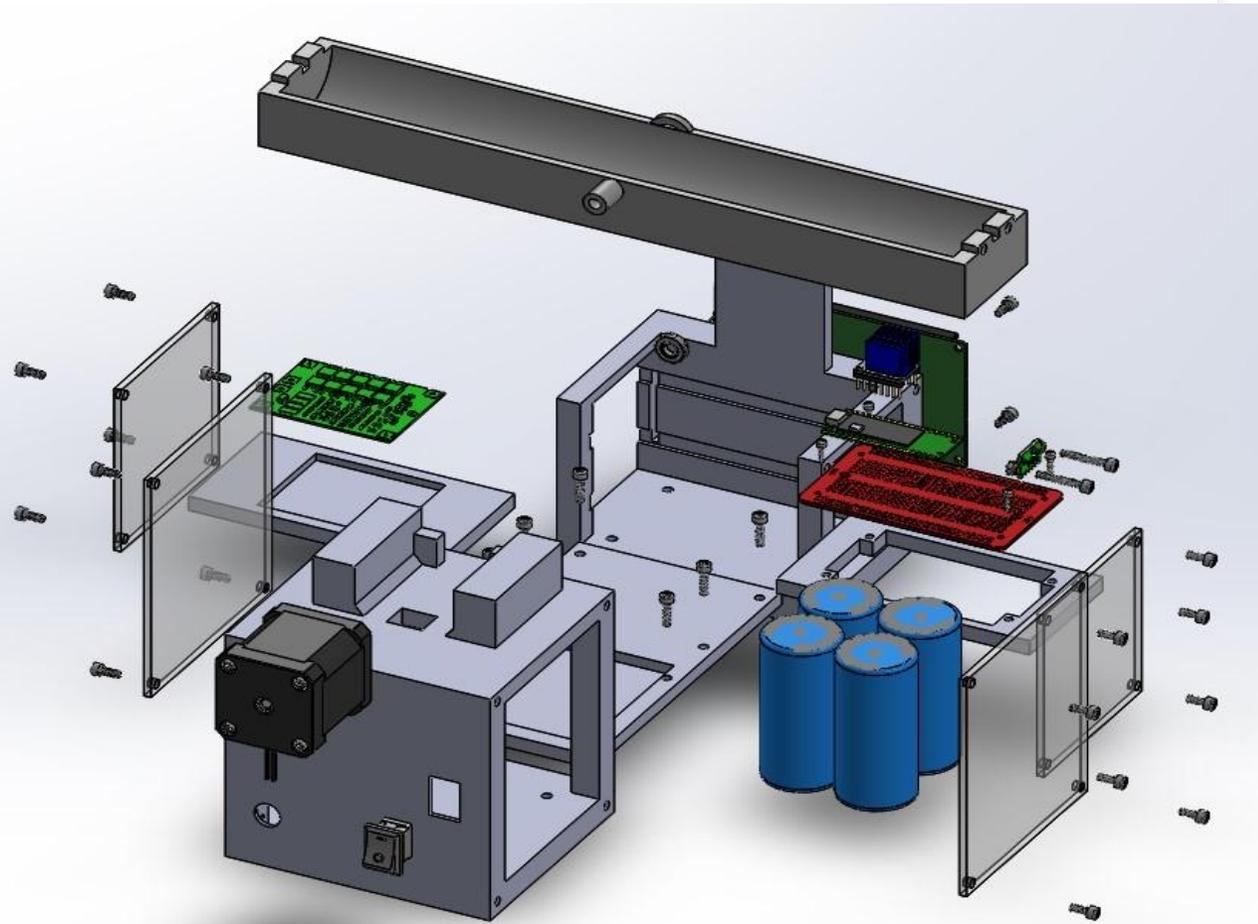
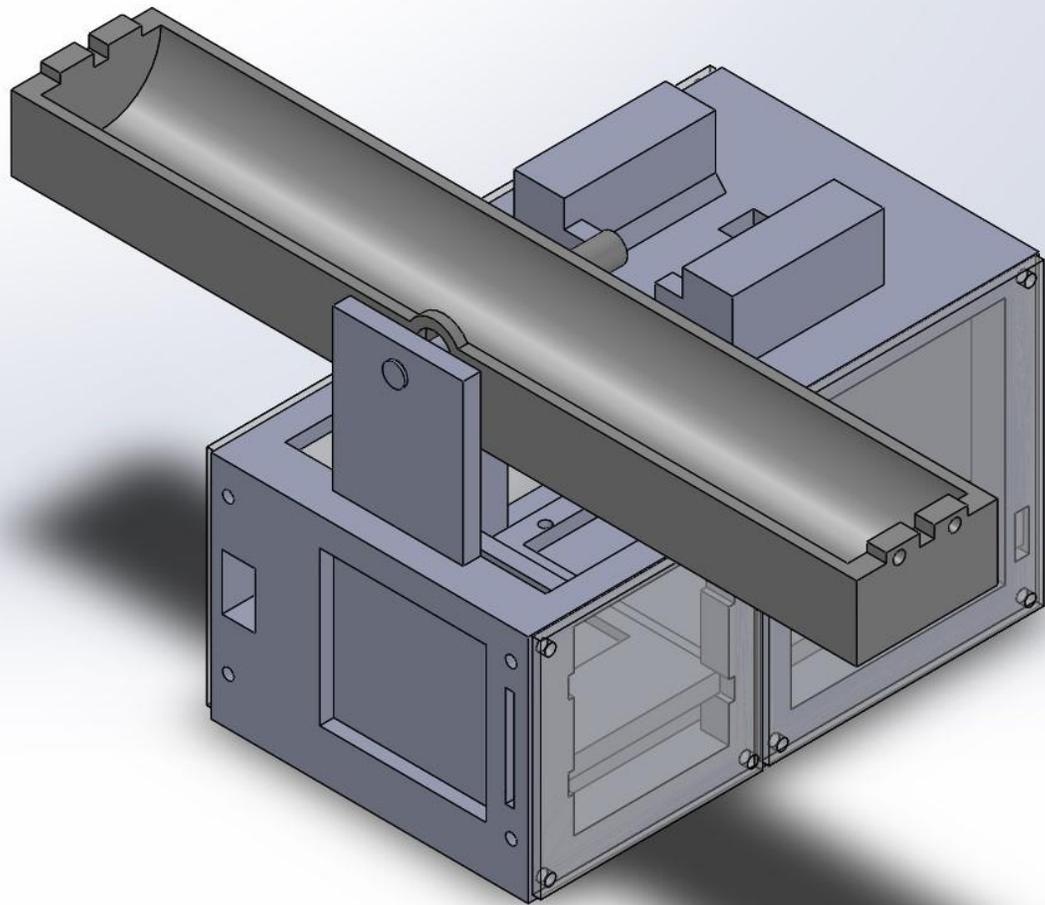
September 2025 - December 2025



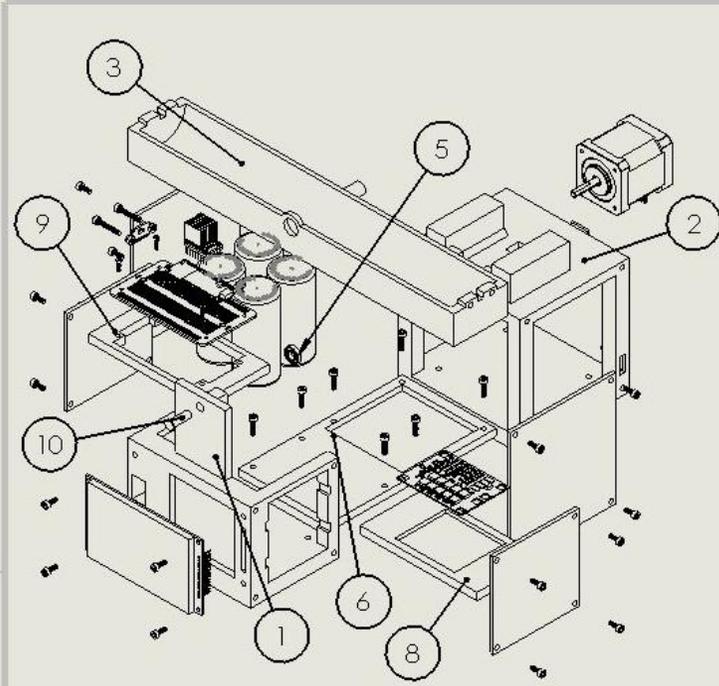
January 2026

- Less parts = Less material
- Stability
- Reduction size (14"x 7.5")
- Spacious for Electrical components
- Multiple functionality with each individual part
- Flows efficiently

Robot 2 Updated CAD



Robot 2 Updated CAD



ITEM NO.	MANUFACTURED PART NUMBER	DESCRIPTION	QTY.
1	Center Hub	Mechanical	1
2	Motor_HolderV3	Structural	1
3	New_Beam	Mechanical	1
6	Inside Base Plate	Structural	1
8	Shelve for BMS	Structural	1
9	Shelve For ProtoboardV2	Structural	1
10	Shaft Plug	Mechanical	1
23	Center Hub Glass		2
24	Motor Holder Glass		2

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN MILLIMETERS		Drawn	Rorence F. 2/25/2026
TOLERANCES: ± 0.2mm		CHECKED	
FRACTIONAL		ENG APPR.	
ANGULAR: MACH ± BEND ±		MFG APPR.	
TWO PLACE DECIMAL ±		G.A.	
THREE PLACE DECIMAL ±		COMMENTS:	
INTERPRET GEOMETRIC TOLERANCING PER:			
MATERIAL		Acrylic and PLA	
FINISH			
NEXT ASSY	USED ON	TITLE: Exploded View of Robot 2 V3	
APPLICATION		DO NOT SCALE DRAWING	SIZE DWG. NO. REV A Assembly_Robot2_V3
		SCALE: 1:8 WEIGHT:	SHEET 1 OF 1

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Purchasing Plan - Robot 2

Category	Item Description	Total Qty Ordered	Price Per Unit	Total Price	Status
Electronics & Power	Nema 17 Stepper Motor	5 Units	\$14.99	\$74.95	RECEIVED
Electronics & Power	ToF Sensor (VL53L0X)	3 Packs (1 Unit + 2 Packs)	\$12.99	\$38.97	RECEIVED
Electronics & Power	LiFePO4 Batteries	4 Boxes	\$31.99	\$127.96	RECEIVED
Electronics & Power	LCD Screen (4-inch)	5 Units	\$20.99	\$104.95	RECEIVED
Electronics & Power	Voltage Step-Down	2 Packs	\$8.69	\$17.38	RECEIVED
Electronics & Power	BMS Board (14.8V)	3 Packs	\$8.99	\$26.97	RECEIVED
Electronics & Power	Microcontroller (RP2040/Pico)	3 Units	\$12.99	\$38.97	RECEIVED
Electronics & Power	LiFePO4 Battery Charger	4 Units	\$14.59	\$58.36	RECEIVED
Electronics & Power	Protoboard Set	2 Packs	\$13.59	\$27.18	RECEIVED
Electronics & Power	Stepper Motor Driver TMC2208	1 Unit	\$17.99	\$17.99	RECEIVED
Electronics & Power	Rocker Switch (On/Off)	4 Units	\$7.99	\$31.96	RECEIVED
Hardware & Fasteners	686 Ball Bearings (10-pack)	2 Packs	\$8.59	\$17.18	RECEIVED
Hardware & Fasteners	Longer M3 Threaded Inserts	2 Packs	\$9.99	\$19.98	RECEIVED
Hardware & Fasteners	Shorter M3 Threaded Inserts	1 Pack	\$9.99	\$9.99	RECEIVED
Hardware & Fasteners	M2 Threaded Inserts	1 Pack	\$9.99	\$9.99	RECEIVED
Hardware & Fasteners	M3 x 12mm Socket Screws	1 Pack (100pcs)	\$8.95	\$8.95	RECEIVED
Hardware & Fasteners	M3 x 8mm Socket Screws	1 Pack (100pcs)	\$8.95	\$8.95	RECEIVED
Hardware & Fasteners	M2 Screw Assortment Box	1 Box	\$14.99	\$14.99	RECEIVED
Hardware & Fasteners	M3 Zinc Hex Nuts (5-piece)	2 Packs	\$3.75	\$7.50	RECEIVED
Wiring & Materials	22 AWG Hookup Wire	1 Pack	\$15.29	\$15.29	RECEIVED
Wiring & Materials	Dupont Jumper Wire Set	1 Pack	\$6.98	\$6.98	RECEIVED
Wiring & Materials	Header Pins	1 Pack	\$7.39	\$7.39	RECEIVED
Wiring & Materials	Hyper PLA Filament (Black)	3 Rolls	\$17.99	\$53.97	ORDERED
Wiring & Materials	KAITELA Clear Acrylic Sheets 4"x6"	2 Packs	\$16.99	\$33.98	ORDERED

Requirement	Target	Current Progress	Raw Numbers	Status
Total Items Ordered	100%	100%	26 / 26 Items	<input checked="" type="checkbox"/> Goal Met
Total Items On-Hand	> 67%	92%	24 / 26 Items	<input checked="" type="checkbox"/> Goal Met

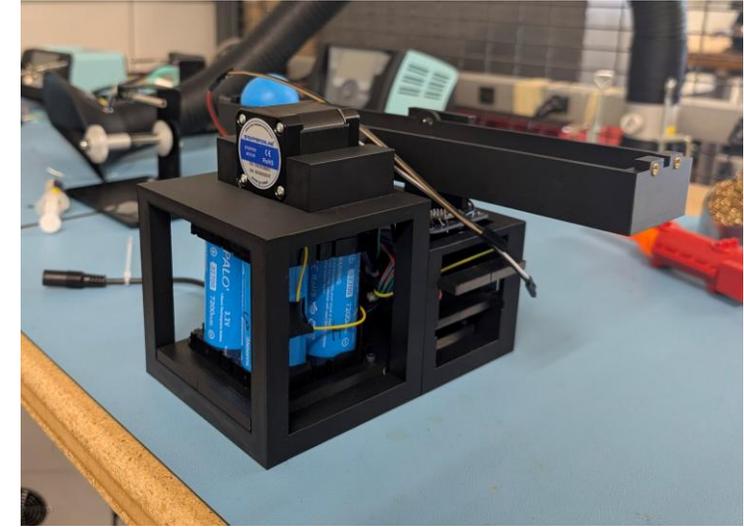
Raw Estimates:	1 Unit:	All 5:
	\$305.63	\$780.78

Manufacturing Plan - Robot 2

Part	Time [hours]	Manufacturing Method	Progress Percent
Center Hubs (5x)	5	3D Printed	100%
Backbones (5x)	3	3D Printed	100%
BMS Shelves (5x)	3	3D Printed	100%
Protoboard Shelves (5x)	2	3D Printed	100%
Shaft Plugs (5x)	:06	3D Printed	100%
Motor Holders (5x)	6	3D Printed	100%
Beams (5x)	5	3D Printed	100%
Soldered Protoboards (5x)	5	Soldered	20%
Soldered Battery Packs (5x)	5	Soldered	20%
Acrylic Glass Covers (5x)	:30	Cut / Drilled	0%
Total	34		74.00%

File Part	Total PLA Filament (g)	Total Time (hrs:min)	Costs (\$USD)
Motor Holder	188.69 g	6:03	\$3.39
Center Hub	136.28 g	4:47	\$2.45
Protoboard Shelf	11.60 g	1:01	\$0.21
Inside Base Plate	38.90 g	2:11	\$0.70
Shelve for BMS	21.80 g	2:27	\$0.39
Shaft Plug	0.50 g	0:07	\$0.01
Beam	115.00 g	5:37	\$2.07
TOTAL PER ROBOT	512.97 g	22:13	\$9.23

— Physical Builds



Robot 2: Ball - on - Beam

Moving Forward - Robot 2 (Ball-on-Beam)

- **Integration Testing Initiated:** We have successfully moved from mechanical assembly into active electrical integration and testing.
- **Current Roadblock (Dual-Power Conflict):** We identified a critical power-rail issue. Connecting the primary battery simultaneously with the USB backfeeding and shorting the Raspberry Pi Pico boards.
- **Active Engineering Solution:** To safely isolate the power sources, our sub-team is currently designing and prototyping a custom protection circuit
- **Strategic Pivot to 100% Build:** Because mechanical manufacturing is 100% printed and ahead of schedule, all sub-team bandwidth is now reallocated directly to implementing this power-switching circuit to ensure a fully functioning 5-robot fleet for the final deadline.

Thank You

