

# ***ROCKO***

## Bill of Materials (BOM)

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Hardware	196.778
Printed Parts	17.96832
Laser Cut Parts	40
COTS/Electronics	495.19
Total Cost	749.94

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	UNIT COST (\$)	COST (\$)	RETAILER	LINK
1	94180A353	M4x0.7 Brass Tapered Heat-Set Inserts for Plastic	37	0.2558	9.4646	McMaster-Carr	<a href="https://www.mcmaster.com/94180A3">https://www.mcmaster.com/94180A3</a>
2	94180A312	M2x0.4 Tapered Heat-Set Inserts for Plastic	10	0.2241	2.241	McMaster-Carr	<a href="https://www.mcmaster.com/94180A3">https://www.mcmaster.com/94180A3</a>
3	92981A754	8mm_75mmL_Alloy Steel Shoulder Screws	4	5.98	23.92	McMaster-Carr	<a href="https://www.mcmaster.com/92981A7">https://www.mcmaster.com/92981A7</a>
4	92981A210	8mm_55mmL_Alloy Steel Shoulder Screws	2	5.16	10.32	McMaster-Carr	<a href="https://www.mcmaster.com/92981A2">https://www.mcmaster.com/92981A2</a>
5	92981A202	8mm_16mmL_Alloy Steel Shoulder Screws	2	1.98	3.96	McMaster-Carr	<a href="https://www.mcmaster.com/92981A2">https://www.mcmaster.com/92981A2</a>
6	92832A343	M4x0.7_25mmL_Zinc-Plated Steel Button Head Torx Screws	2	0.2108	0.4216	McMaster-Carr	<a href="https://www.mcmaster.com/92832A3">https://www.mcmaster.com/92832A3</a>
7	92832A334	M4x16mmL_Zinc-Plated Steel Button Head Torx Screws	88	0.1506	13.2528	McMaster-Carr	<a href="https://www.mcmaster.com/92832A3">https://www.mcmaster.com/92832A3</a>
8	92467A452	M2x0.4_10mmL_18-8 Stainless Steel Extra-Wide Truss Head Phillips Screws	14	0.142	1.988	McMaster-Carr	<a href="https://www.mcmaster.com/92467A4">https://www.mcmaster.com/92467A4</a>
9	91292A036	M2.5x0.45_25mmL_18-8 Stainless Steel Socket Head Screw	4	0.793	3.172	McMaster-Carr	<a href="https://www.mcmaster.com/91292A0">https://www.mcmaster.com/91292A0</a>
10	91202A226	M4_Zinc-Plated Steel Split Lock Washer	2	0.0187	0.0374	McMaster-Carr	<a href="https://www.mcmaster.com/91202A2">https://www.mcmaster.com/91202A2</a>
11	91166A250	M6_Zinc-Plated Steel Washer	12	0.0272	0.3264	McMaster-Carr	<a href="https://www.mcmaster.com/91166A2">https://www.mcmaster.com/91166A2</a>
12	91166A230	M4_Zinc-Plated Steel Washer	18	0.0244	0.4392	McMaster-Carr	<a href="https://www.mcmaster.com/91166A2">https://www.mcmaster.com/91166A2</a>
13	91116A120	M3_18-8 Stainless Steel Oversized Washer	10	0.0493	0.493	McMaster-Carr	<a href="https://www.mcmaster.com/91116A1">https://www.mcmaster.com/91116A1</a>
14	90991A123	M4x0.7_12mmL_18-8 Stainless Steel Button Head Torx Screws	10	0.0936	0.936	McMaster-Carr	<a href="https://www.mcmaster.com/90991A1">https://www.mcmaster.com/90991A1</a>
15	90591A270	M2.5x0.45_Zinc-Plated Steel Hex Nut	4	0.0222	0.0888	McMaster-Carr	<a href="https://www.mcmaster.com/90591A2">https://www.mcmaster.com/90591A2</a>
16	90576A115	M6x1.0_Medium-Strength Steel Nylon-Insert Locknut	12	0.0648	0.7776	McMaster-Carr	<a href="https://www.mcmaster.com/90576A1">https://www.mcmaster.com/90576A1</a>
17	90576A103	M4x0.7_Medium-Strength Steel Nylon-Insert Locknut	52	0.0582	3.0264	McMaster-Carr	<a href="https://www.mcmaster.com/90576A1">https://www.mcmaster.com/90576A1</a>
18	8497A69	M12x1.75_Knob-Style Retractable Spring Plunger	2	19.90	39.8	McMaster-Carr	<a href="https://www.mcmaster.com/8497A67">https://www.mcmaster.com/8497A67</a>
19	6659K678	8mm_10mmL_Oil-Embedded Flanged Sleeve Bearing	8	4.67	37.36	McMaster-Carr	<a href="https://www.mcmaster.com/6659K67">https://www.mcmaster.com/6659K67</a>
20	6659K677	8mm_6mmL_Oil-Embedded Flanged Sleeve Bearing	4	3.81	15.24	McMaster-Carr	<a href="https://www.mcmaster.com/6659K67">https://www.mcmaster.com/6659K67</a>
21	6659K115	8mm_4mmL_Oil-Embedded Flanged Sleeve Bearing	2	2.52	5.04	McMaster-Carr	<a href="https://www.mcmaster.com/6659K11">https://www.mcmaster.com/6659K11</a>
22	6658K135	8mm_10mmL_Oil-Embedded 841 Bronze Sleeve Bearing	4	1.92	7.68	McMaster-Carr	<a href="https://www.mcmaster.com/6658K13">https://www.mcmaster.com/6658K13</a>
23	90591A250	M3x0.5_Zinc-Plated Steel Hex Nut	8	0.0281	0.2248	McMaster-Carr	<a href="https://www.mcmaster.com/90591A2">https://www.mcmaster.com/90591A2</a>
24	91290A123	M3x0.5_20mmL_Alloy Steel Socket Head Screw	8	0.1414	1.1312	McMaster-Carr	<a href="https://www.mcmaster.com/91290A1">https://www.mcmaster.com/91290A1</a>
25	90591A265	M2 x 0.4_Zinc-Plated Steel Hex Nut	4	0.0222	0.0888	McMaster-Carr	<a href="https://www.mcmaster.com/90591A2">https://www.mcmaster.com/90591A2</a>
26	91292A335	M2 x 0.40 mm Thread, 15 mm Long	4	2.668	10.672	McMaster-Carr	<a href="https://www.mcmaster.com/91292A3">https://www.mcmaster.com/91292A3</a>
27	91290A334	M6x1.0_35mmL_Alloy Steel Socket Head Screw	4	0.2366	0.9464	McMaster-Carr	<a href="https://www.mcmaster.com/91290A3">https://www.mcmaster.com/91290A3</a>
28	8974K22	1/4in diameter, steel rod, 200mm long	1	3.73	3.73	McMaster-Carr	<a href="https://www.mcmaster.com/8974K22">https://www.mcmaster.com/8974K22</a>

**Total**                      **196.778**

ITEM NO.	PART NAME	SUBASSEMBLY LOCATION	QTY.	MATERIAL	FILAMENT QTY (g)	COST (\$)
29	Battery Holder	ROCKO	1	PLA	126.73	2.15441
30	Bottom_Pi_Mount	ROCKO	1	PLA	11.67	0.19839
31	Corner Bracket	HEAD	2	PLA	14.94	0.50796
32	Corner Bumper	HEAD	4	TPU	29.37	1.99716
33	Coupler Pin Spacer	LEG	2	PLA	5.53	0.18802
34	Crank Shoulder Link	CRANK LINK	2	PLA	33.76	1.14784
35	Elbow wheel	ELBOW WHEEL	2	PLA	25.86	0.87924
36	Eye Pupil	HEAD	2	PLA	6.68	0.22712
37	Eye White	HEAD	2	PLA	17.40	0.5916
38	HeadCrossBar	HEAD	4	PLA	20.09	1.36612
39	Inner Shoulder Link	INNER SHOULDER LINK	1	PLA	40.94	0.69598
40	L Bracket	HEAD	2	PLA	10.11	0.34374
41	Leg Link	LOWER LEG	1	PLA	61.71	1.04907
42	Lower Belt Tensioner	LEG	2	PLA	5.72	0.19448
43	M12x1.75 Thin Profile Hex Nut	INNER SHOULDER LINK	4	PLA	1.74	0.11832
44	MD10C_R3-Holder	HEAD	2	PLA	9.66	0.32844
45	MirrorInner Shoulder Link	INNER SHOULDER LINK	1	PLA	40.94	0.69598
46	MirrorLeg Link	LOWER LEG	1	PLA	61.71	1.04907
47	MirrorRear Bumper	HEAD	1	TPU	16.54	0.28118
48	Motor Mount Spacer	HEAD	2	PLA	3.48	0.11832
49	Outer Shoulder Link	OUTER SHOULDER	2	PLA	37.00	1.258
50	Rear Bracket, Left	HEAD	1	PLA	9.27	0.15759
51	Rear Bracket, Right	HEAD	1	PLA	9.27	0.15759
52	Rear Bumper	HEAD	1	TPU	16.54	0.28118
53	RLidar_A1-Holder	HEAD	1	PLA	28.08	0.47736
54	Upper Shoulder Standoff	LEG	6	PLA	3.25	0.3315
55	42T GT2 3mm Wheel Pulley	WHEEL HUB	2	PLA	15.71	0.53414
56	36T GT2 3mm double pulley	DOUBLE PULLEY	2	PLA	9.70	0.3298
57	31T GT2 3mm Pulley	ROCKO	2	PLA	9.08	0.30872

**TOTAL 17.96832**

**Filament cost per gram**

PLA	TPU
0.017	0.02379

**Recommended print settings:**

- Minimum 4 wall loops/perimeters
- Gyroid infill - 25% for structural parts and links
- Grid infill - 15% for electronics mounts
- Consider printing link parts with a brim if parts curl up

ITEM NO.	PART NAME	SUBASSEMBLY LOCATION	QTY.	SIZE (MM)	SIZE (IN)
58	Front Plate	HEAD	1	142 X 300	5.59 X 11.81
59	Side Plate	HEAD	2	142 X 250	5.59 X 9.84
60	Bottom Plate	HEAD	2	252 X 300	9.92 X 11.81

24 x 24 in sheet needed

**Cost                    40**

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	UNIT COST (\$)	COST (\$)	RETAILER	LINK
61	RASPBERRY_PI_5	Single board computer	1	120	120		<a href="https://www.sparkfun.com/raspberry-pi-5-16gb.html?src=raspberr">https://www.sparkfun.com/raspberry-pi-5-16gb.html?src=raspberr</a>
62	MD10C_R3	Motor driver	2	13.9	27.8	Amazon	<a href="https://www.amazon.com/Cytron-13A-Motor-Driver-MD10C/dp/B">https://www.amazon.com/Cytron-13A-Motor-Driver-MD10C/dp/B</a>
63	ECO-WORTHY 12V 10Ah Lithi	EcoWorthy Battery 10Ah, LiFePo	1	37.99	37.99	Amazon	<a href="https://www.amazon.com/ECO-WORTHY-Phosphate-Rechargeab">https://www.amazon.com/ECO-WORTHY-Phosphate-Rechargeab</a>
64	5204-8002-0005_GoBuil	Drive motor	2	45	90	GoBuilda	<a href="https://www.gobilda.com/5204-series-yellow-jacket-planetary-ge">https://www.gobilda.com/5204-series-yellow-jacket-planetary-ge</a>
65	3601-0014-0120_120mm Rhino Wheel	Drive wheel	2	9.99	19.98	GoBuilda	<a href="https://www.gobilda.com/3601-series-rhino-wheel-14mm-bore-120">https://www.gobilda.com/3601-series-rhino-wheel-14mm-bore-120</a>
66	1611-0514-4008_Hex bearing_8mm shaft	Bearings for drive motor shaft	6	2.995	17.97	GoBuilda	<a href="https://www.gobilda.com/1611-series-flanged-ball-bearing-8mm-d">https://www.gobilda.com/1611-series-flanged-ball-bearing-8mm-d</a>
67	1611-0514-0008_Round bearing_8mm shaft	Bearings for pulley and wheel	12	1.995	23.94	GoBuilda	<a href="https://www.gobilda.com/1611-series-flanged-ball-bearing-8mm-d">https://www.gobilda.com/1611-series-flanged-ball-bearing-8mm-d</a>
68	12V -> 5V Step Down Circuit	Allows for power to 5V components from 12V supply	1	4.98	4.98	RobotShop	<a href="https://www.robotshop.com/products/dfrobot-dc-dc-buck-conve">https://www.robotshop.com/products/dfrobot-dc-dc-buck-conve</a>
69	BNO055	9-DOF Absolute IMU	1	34.95	34.95	Adafruit	<a href="https://www.adafruit.com/product/2472">https://www.adafruit.com/product/2472</a>
70	WaGO Terminal Connector (3-wire)	Used for wire connection	1	8.96	8.96	Amazon	<a href="https://www.amazon.com/WAGO-221-412-Lever-Nuts-2-Conducto">https://www.amazon.com/WAGO-221-412-Lever-Nuts-2-Conducto</a>
71	WAGO Terminal Connector (5-wire)	Used for wire connection	1	16.88	16.88	Amazon	<a href="https://www.amazon.com/Electrical-Conductor-parallel-silicone-f">https://www.amazon.com/Electrical-Conductor-parallel-silicone-f</a>
72	UART Interface	Connects computer to Raspberry Pi	1	12	12	Adafruit	<a href="https://www.adafruit.com/product/5699">https://www.adafruit.com/product/5699</a>
73	USB-C Cable		1	5.97	5.97	Amazon	<a href="https://www.amazon.com/Raspberry-Pi-Active-Cooler/dp/B0CLX">https://www.amazon.com/Raspberry-Pi-Active-Cooler/dp/B0CLX</a>
74	USB Hub		1	17.99	17.99	Amazon	<a href="https://www.amazon.com/Sabrent-Individual-Switches-Included-I">https://www.amazon.com/Sabrent-Individual-Switches-Included-I</a>
75	14 AWG wire	For connecting 12V power	1	9.98	9.98	Amazon	<a href="https://www.amazon.com/Electrical-Conductor-parallel-silicone-f">https://www.amazon.com/Electrical-Conductor-parallel-silicone-f</a>
76	20 AWG wire	For connecting sensors and GPIO	1	14.58	14.58	Amazon	<a href="https://www.amazon.com/Silicone-Electrical-electronics-strandec">https://www.amazon.com/Silicone-Electrical-electronics-strandec</a>
77	Gates 3MR-450-06 Belt	Upper drive belt, 3mm pitch, 6mm width, 150T	2	8.36	16.72	Biedler's Belts	<a href="https://www.biedlers-belts.com/synchronous-belts/powergrip-gt2-">https://www.biedlers-belts.com/synchronous-belts/powergrip-gt2-</a>
78	Gates 3MR-480-06 Belt	Lower drive belt, 3mm pitch,	2	7.25	14.5	Biedler's Belts	<a href="https://www.biedlers-belts.com/synchronous-belts/powergrip-gt2-">https://www.biedlers-belts.com/synchronous-belts/powergrip-gt2-</a>

**Total**

**495.19**