

Work Breakdown Structure Financial Report
Team Name: Team Mountaineers

WBS #	Description	Manufacturer	Part	Vendor	Cost Rule	Unit Cost	Quantity	Item Total Cost*	System Total Cost*	
0	TOTAL ROVER COST								\$23,299.64	
1	ROVER CHASSIS AND WHEELS								\$5,844.85	
1.1	Chassis Components									
1.1.1	Protocase Chassis and Motorpods	Protocase	N/A	Protocase	New - Purchase Cost Applie	\$1,592.49	1	\$1,592.49		
1.1.2	MyActuator RMD-X8-P20-120-E	MyActuator	RMD-X8-P20-120-E	RobotShop	Donated - Market Price App	\$599.00	4	\$2,396.00		
1.2	Materials									
1.2.1	1" Square Tube	McMaster-Carr	6546K52	McMaster-Carr	New - Purchase Cost Applie	\$27.88	1	\$27.88		
1.2.2	Carbon Fiber Extension Pole 3.5-12FT	DOBEN		Amazon	New - Purchase Cost Applie	\$56.99	1	\$56.99		
1.3	Machined Parts									
1.3.1	WVU Lane Innovation Hub	Machined Parts	N/A	N/A	New - Purchase Cost Applie	\$1,007.29	1	\$1,007.29		
1.3.2	OshCut Parts	Machined Parts	N/A	N/A	New - Purchase Cost Applie	\$152.26	1	\$152.26		
1.4	Fasteners									
1.4.1	Domed Head Blind Rivets 0.063"-0.125"	McMaster-Carr	97526A120	McMaster-Carr	New - Purchase Cost Applie	\$0.05	738	\$38.79		
1.4.2	Domed Head Blind Rivets 0.126"-0.187"	McMaster-Carr	97526A125	McMaster-Carr	New - Purchase Cost Applie	\$0.05	36	\$1.84		
1.4.3	Medium-Strength Class 8.8 Steel Hex Head Screw	McMaster-Carr	91280A548	McMaster-Carr	New - Purchase Cost Applie	\$0.49	4	\$1.98		
1.4.4	Zinc-Plated Steel General Purpose Washer	McMaster-Carr	91166A270	McMaster-Carr	New - Purchase Cost Applie	\$0.03	4	\$0.13		
1.4.5	18-8 Stainless Steel Split Lock Washer	McMaster-Carr	92148A200	McMaster-Carr	New - Purchase Cost Applie	\$0.11	4	\$0.43		
1.4.6	Medium-Strength Steel Nylon-Insert Locknut	McMaster-Carr	90576A117	McMaster-Carr	New - Purchase Cost Applie	\$0.12	4	\$0.48		
1.4.7	Threaded on One End Steel Stud	McMaster-Carr	97493A131	McMaster-Carr	New - Purchase Cost Applie	\$1.31	16	\$20.93		
1.4.8	18-8 Stainless Steel Torx Flat Head Screws (M4 x 30 mm)	McMaster-Carr	92703A461	McMaster-Carr	New - Purchase Cost Applie	\$0.18	48	\$8.47		
1.4.9	M6-1.00 x 50 mm 8.8 Hex Cap Screws	McMaster-Carr	91280A072	McMaster-Carr	Used - Equivalent Item Cos	\$0.16	40	\$6.42		
1.4.10	M6-1.00 x 50 mm 8.8 Hex Cap Screws	McMaster-Carr	90991A114	McMaster-Carr	New - Purchase Cost Applie	\$0.05	16	\$0.83		
1.4.11	Heavy Duty Twist-Resistant Hex-Shaped Rivet Nuts (M6)	McMaster-Carr	90720A510	McMaster-Carr	New - Purchase Cost Applie	\$0.30	72	\$21.48		
1.4.12	70 Degree Angle, Round Grip, Chrome Plated Steel, 100 mm Wide	McMaster-Carr	1656A028	McMaster-Carr	New - Purchase Cost Applie	\$13.76	4	\$55.04		
1.4.13	Unthreaded Hole Pull Handle	McMaster-Carr	2471N2	McMaster-Carr	New - Purchase Cost Applie	\$19.20	1	\$19.20		
1.4.14	PVC, Removable Pin, 2-1/2" High x 1-1/16" Wide Door Leaf	McMaster-Carr	1635A71	McMaster-Carr	New - Purchase Cost Applie	\$6.75	2	\$13.50		
1.4.15	Black, Twist-to-Lock, Zinc Plate and .24" Diameter Steel Nose, 1.77" Long	McMaster-Carr	8478A5	McMaster-Carr	New - Purchase Cost Applie	\$16.59	4	\$66.36		
1.4.16	Nylon Ribbed Knob	McMaster-Carr	62935K11	McMaster-Carr	New - Purchase Cost Applie	\$2.63	2	\$5.26		
1.4.17	Film from Teflon	McMaster-Carr	8569K48	McMaster-Carr	New - Purchase Cost Applie	\$73.14	1	\$73.14		
1.4.18	Multipurpose 6061 Aluminum Rectangular Tube	McMaster-Carr	6546K52	McMaster-Carr	New - Purchase Cost Applie	\$6.97	0.75	\$5.23		
1.4.19	High-Strength Lightweight Carbon Fiber Tube	McMaster-Carr	5287T21	McMaster-Carr	New - Purchase Cost Applie	\$105.86	1	\$105.86		
1.4.20	High-Strength Steel Nylon-Insert Locknut (M5 x 0.8 mm)	McMaster-Carr	9464A102	McMaster-Carr	New - Purchase Cost Applie	\$0.16	40	\$6.26		
1.4.21	Plastic Hinge with Holes	McMaster-Carr	1635A712	McMaster-Carr	New - Purchase Cost Applie	\$6.75	4	\$27.00		
1.4.22	Stainless Steel Button Head Torx Screw (M3 x 45mm)	McMaster-Carr	92095A474	McMaster-Carr	New - Purchase Cost Applie	\$0.16	40	\$6.53		
1.4.23	Stainless Steel Button Head Torx Screw (M3 x 55mm)	McMaster-Carr	92095A120	McMaster-Carr	New - Purchase Cost Applie	\$0.19	80	\$15.58		
1.4.24	Stainless Steel Button Head Torx Screw (M5 x 45mm)	McMaster-Carr	92095A223	McMaster-Carr	New - Purchase Cost Applie	\$0.44	40	\$17.60		
1.4.25	High-Strength Steel Nylon-Insert Locknut (M3 x 0.5 mm)	McMaster-Carr	90576A102	McMaster-Carr	New - Purchase Cost Applie	\$0.06	250	\$13.88		
1.4.26	18-8 Stainless Steel Torx Flat Head Screws (M6 x 16 mm)	McMaster-Carr	92703A166	McMaster-Carr	New - Purchase Cost Applie	\$0.25	10	\$2.54		
1.4.27	Stainless Steel Button Head Torx Screw (M6 x 12 mm)	McMaster-Carr	90991A132	McMaster-Carr	New - Purchase Cost Applie	\$0.16	20	\$3.16		
1.4.28	Stainless Steel Button Head Torx Screw (M3 x 10 mm)	McMaster-Carr	90991A114	McMaster-Carr	New - Purchase Cost Applie	\$0.05	4	\$0.21		
1.4.29	Stainless Steel Button Head Torx Screw (M3 x 6 mm)	McMaster-Carr	92125A126	McMaster-Carr	New - Purchase Cost Applie	\$0.07	4	\$0.27		
1.4.30	Stainless Steel Button Head Torx Screw (M3 x 35 mm)	McMaster-Carr	90910A576	McMaster-Carr	New - Purchase Cost Applie	\$0.15	5	\$0.75		
1.4.31	18-8 Stainless Steel General Purpose Washer	McMaster-Carr	93475A210	McMaster-Carr	New - Purchase Cost Applie	\$0.02	9	\$0.22		
1.4.32	Stainless Steel Button Head Torx Screw (M3 x20 mm)	McMaster-Carr	90910A574	McMaster-Carr	New - Purchase Cost Applie	\$0.16	16	\$2.62		
1.4.33	M3 Standoff Kit	MCMASKE		Amazon	New - Purchase Cost Applie	\$11.99	1	\$11.99		
1.4.34	Angle Bar	Randall Manufacturing Co.		Amazon	New - Purchase Cost Applie	\$28.99	2	\$57.98		
2	DRONE PARTS								\$2,401.99	
2.1	Mavic 2 PRO with Fly more Combo	DJI	CP.MA.0000019.01	DJI	New - Purchase Cost Applie	\$1,899.00	1	\$1,899.00	\$4,326.79	
2.2	ALIENTECH DUO II 2.4G/5.8G Dual-band Signal Booster	ALIENTECH	DUO-2458DSB	ALIENTECH	Used - Purchase Cost Appli	\$308.99	1	\$308.99		
2.3	ALIENTECH Deimox series extension coaxial cable 10 meters	ALIENTECH		ALIENTECH	Used - Purchase Cost Appli	\$194.00	1	\$194.00		
3	ELECTRONICS AND ON-BOARD PROCESSING								\$4,326.79	
3.1	On-board Processing/Computers									
3.1.1	NVIDIA Jetson Orin Nano	NVIDIA		Amazon	New - Purchase Cost Applie	\$249.00	1	\$249.00		
3.1.2	Latte Panda Sigma	LattePanda		DF ROBOT	New - Purchase Cost Applie	\$579.00	1	\$579.00		
3.2	Main Electronics Components									
3.2.1	40V Battery	Greenworks		Amazon	Used - Purchase Cost Appli	\$120.00	2	\$240.00		
3.2.2	Emergency Stop Button	mxuteuk		Amazon	New - Purchase Cost Applie	\$11.99	2	\$23.98		
3.2.3	USB hub	Anker		Amazon	Used - Purchase Cost Appli	\$69.99	2	\$139.98		
3.2.4	USB hub	Acer		Amazon	New - Purchase Cost Applie	\$14.99	1	\$14.99		
3.2.5	USB2CAN converter	innomaker		Amazon	New - Purchase Cost Applie	\$33.00	2	\$66.00		
3.2.6	Fans	Sanyo Denki America Inc	1688-2216-ND	DigiKey	New - Purchase Cost Applie	\$17.04	4	\$68.16		
3.2.7	LED Control Board	Nem Tech	NT003-004	Amazon	New - Purchase Cost Applie	\$12.95	1	\$12.95		
3.2.8	Single LEDs	LEDGUHON	JH-12ZRGBW14G45-E2B-M	Amazon	New - Purchase Cost Applie	\$2.94	5	\$14.69		
3.2.9	Limit Switches	E-Switch	MS0850506F020P1C	DigiKey	New - Purchase Cost Applie	\$1.46	2	\$2.92		
3.3	Power Distribution Board									
3.3.1	Printed Circuit Board	JLPCPB		JLPCPB	New - Purchase Cost Applie	\$10.26	1	\$10.26		
3.3.2	22 µF 50V Capacitor X7R 2220 (5750 Metric)	TDK Corporation	C5750X7S2A226M280KB	DigiKey	New - Purchase Cost Applie	\$0.21	2	\$0.42		
3.3.3	220 µF 50 V Aluminum Electrolytic Capacitor	Chemt-Con	EMZR500AR221MHA0G	DigiKey	New - Purchase Cost Applie	\$0.57	2	\$1.15		
3.3.4	330 µF 50 V Aluminum Electrolytic Capacitor	KEMET	ESW337M050AH4EA	DigiKey	New - Purchase Cost Applie	\$0.63	3	\$1.89		
3.3.5	100 µF 50 V Aluminum Electrolytic Capacitor	Panasonic Electronic Comp	EEE-FT1H101XAP	DigiKey	New - Purchase Cost Applie	\$0.80	4	\$2.38		
3.3.6	22 µF 50 V Aluminum Electrolytic Capacitor	KEMET	ESK226M050AC3FA	DigiKey	New - Purchase Cost Applie	\$0.12	4	\$0.47		
3.3.7	0.1 µF ±10% 100V Ceramic Capacitor	Samsung Electro-Mechanics	CL121B104KCFNNNE	DigiKey	New - Purchase Cost Applie	\$0.02	5	\$0.10		
3.3.8	22 µF ±10% 25V Ceramic Capacitor	Samsung Electro-Mechanics	CL31A226KANNNE	DigiKey	New - Purchase Cost Applie	\$0.28	1	\$0.28		
3.3.9	10 µF ±10% 63V Ceramic Capacitor	Samsung Electro-Mechanics	CL32B106KANNWE	DigiKey	New - Purchase Cost Applie	\$0.58	6	\$3.49		
3.3.10	Green 573nm LED Indication	American Opto Plus LED	L171L-GC	DigiKey	New - Purchase Cost Applie	\$0.18	6	\$1.10		
3.3.11	Zener Diode 10 V 500 mW	Micro Commercial Compone	BZT52C10-TP	DigiKey	New - Purchase Cost Applie	\$0.06	6	\$0.37		
3.3.12	Diode Array 1 Pair Common Cathode 100 V 5A	Diodes Incorporated	MBRD10100CT-13	DigiKey	New - Purchase Cost Applie	\$0.80	1	\$0.80		
3.3.13	Diode Array 1 Pair Common Cathode 100 V 15A	Diodes Incorporated	SBR15U100CTLQ-13	DigiKey	New - Purchase Cost Applie	\$1.48	1	\$1.48		
3.3.14	Diode 150 V 1A Surface Mount SMA	Diodes Incorporated	SBR1U150SA-13	DigiKey	New - Purchase Cost Applie	\$0.48	6	\$2.90		
3.3.15	Fuse Holder 30 A 500V 1 Circuit Blade Through Hole	Keystone Electronics	3568	DigiKey	New - Purchase Cost Applie	\$0.88	6	\$5.28		
3.3.16	Connector Header Through Hole 2 position	Molex	768290102	DigiKey	New - Purchase Cost Applie	\$0.89	6	\$5.34		
3.3.17	Connector Header Through Hole 4 position 0.165"	Molex	39293046	DigiKey	New - Purchase Cost Applie	\$0.42	3	\$1.25		
3.3.18	Connector Header Through Hole 8 position 0.165"	Molex	39281083	DigiKey	New - Purchase Cost Applie	\$1.33	2	\$2.66		
3.3.19	Connector Header Through Hole 10 position 0.165"	Molex	39281103	DigiKey	New - Purchase Cost Applie	\$1.27	1	\$1.27		
3.3.20	Connector Header Through Hole 12 position 0.165"	Molex	39281123	DigiKey	New - Purchase Cost Applie	\$1.06	1	\$1.06		
3.3.21	Connector Header Through Hole 8 position 0.224"	Molex	768290108	DigiKey	New - Purchase Cost Applie	\$2.38	2	\$4.76		
3.3.22	Connector Header Through Hole 2 position	Molex	39281023	DigiKey	New - Purchase Cost Applie	\$0.49	1	\$0.49		
3.3.23	Connector Header Through Hole 4 position 0.224"	Molex	768290104	DigiKey	New - Purchase Cost Applie	\$1.81	1	\$1.81		
3.3.24	Non-Isolated Pol. Module DC DC Converter	TDK Lambda	I7C4W008A120V-OC1-R	DigiKey	New - Purchase Cost Applie	\$66.36	1	\$66.36		
3.3.25	Non-Isolated Pol. Module DC DC Converter	TDK Lambda	I7A4W033A033V-OC1-R	DigiKey	New - Purchase Cost Applie	\$82.14	1	\$82.14		
3.3.26	Non-Isolated Pol. Module DC DC Converter	TDK Lambda	I3A4W008A033V-001-R	DigiKey	New - Purchase Cost Applie	\$24.21	3	\$72.63		
3.3.27	Non-Isolated Pol. Module DC DC Converter	TDK Lambda	I3A4W005A150V-001-R	DigiKey	New - Purchase Cost Applie	\$24.47	1	\$24.47		
3.3.28	P-Channel 80 V 50A (Tc) 8.3W (Ta), 136W (Tc)	Vishay Siliconix	SUD59P08-25L-E3	DigiKey	New - Purchase Cost Applie	\$2.20	6	\$13.19		
3.3.29	N-Channel 80 V 100A (Tc) 227W (Tj)	onsemi	FDD86367	DigiKey	New - Purchase Cost Applie	\$1.86	6	\$11.17		
3.3.30	1 kOhms ±5% 0.333W, 1/3W Chip Resistor 0805	RT Connectivity Passive Pro	CRGH08051JK0	DigiKey	New - Purchase Cost Applie	\$0.03	12	\$0.36		
3.3.31	100 kOhms ±5% 0.25W, 1/4W Chip Resistor 0805	KOA Speer Electronics	RK73B2ATD104J	DigiKey	New - Purchase Cost Applie	\$0.03	7	\$0.18		
3.3.32	5 mOhms ±1% 7W Chip Resistor Nonstandard Automotive	Vishay Dale	WSHM28185L000FEA	DigiKey	New - Purchase Cost Applie	\$1.13	6	\$6.80		
3.3.33	Inrush Current Limiter 700 mOhms ±20% 12 A 0.748"	Vishay Amethern	SL18 0R712	DigiKey	New - Purchase Cost Applie	\$1.24	6	\$7.44		
3.3.34	0 Ohms Jumper Chip Resistor 0805	Stackpole Electronics Inc	RMCF0805270R00	DigiKey	New - Purchase Cost Applie	\$0.01	6	\$0.07		
3.3.35	1 Ohms Jumper Chip Resistor 0805	Stackpole Electronics Inc	RMCF0805270R00	DigiKey	New - Purchase Cost Applie	\$0.01	6	\$0.07		
3.3.36	4.53 kOhms ±0.5% 0.125W, 1/8W Chip Resistor 0805	Yageo	RT0805DR074K53L	DigiKey	New - Purchase Cost Applie	\$0.10	1	\$0.10		
3.3.37	1.13 kOhms ±0.5% 0.125W, 1/8W Chip Resistor 0805	Yageo	RT0805DR071K13L	DigiKey	New - Purchase Cost Applie	\$0.10	1	\$0.10		
3.3.38	30.5 kOhms ±0.1% 0.125W, 1/8W Chip Resistor 0805	Yageo	RT0805BR0730K5L	DigiKey	New - Purchase Cost Applie	\$0.16	1	\$0.16		
3.3.39	8.45 kOhms ±0.5% 0.1W, 1/10W Chip Resistor 0805	Susumu	RR1220P-8451-D-M	DigiKey	New - Purchase Cost Applie	\$0.10	1	\$0.10		
3.3.40	287 Ohms ±0.5% 0.1W, 1/10W Chip Resistor 0805	Susumu	RR1220P-2870-D-M	DigiKey	New - Purchase Cost Applie	\$0.10	1	\$0.10		
3.3.41	511 Ohms ±0.5% 0.125W, 1/8W Chip Resistor 0805	Yageo	RT0805DR07511RL	DigiKey	New - Purchase Cost Applie	\$0.10	1	\$0.10		
3.3.42	Connector Header Through Hole 2 position	Molex	39281023	DigiKey	New - Purchase Cost Applie	\$0.49	1	\$0.49		

Work Breakdown Structure Financial Report

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WBS #	Description	Manufacturer	Part	Vendor	Cost Rule	Unit Cost	Quantity	Item Total Cost*	System Total Cost*
3.3.43	RELAY AUTOMOTIVE SPST 30A 48V	CIT Relay and Switch	A11ASP48VDC1.2D	DigiKey	New - Purchase Cost Applie	\$11.55	7	\$10.82	
3.3.44	Power Supply Controller Power Supply Monitor 10-MSOP	Analog Devices Inc	LTC4151HMS#PBF	DigiKey	New - Purchase Cost Applie	\$7.71	6	\$46.24	
3.3.45	OR Controller N+1 ORing Controller N-Channel	Analog Devices Inc	LTC4357HMS#TRPBF	DigiKey	New - Purchase Cost Applie	\$4.85	6	\$29.08	
3.3.46	Molex SL 2x1 header	Molex	705430001	DigiKey	New - Purchase Cost Applie	\$0.87	1	\$0.87	
3.4 Payload PCB									
3.4.1	Printed Circuit Board	JLPCB		JLPCB	New - Purchase Cost Applie	\$29.10	1	\$29.10	
3.4.2	CAP ALUM 1000UF 20% 25V RADIAL	Nichicon	493-1065-ND	DigiKey	New - Purchase Cost Applie	\$0.63	3	\$1.89	
3.4.3	CAP CER 0.1UF 50V X7R 1206	KEMET	399-C1206C104J5RACTUCT-ND	DigiKey	New - Purchase Cost Applie	\$0.15	11	\$1.65	
3.4.4	CAP CER 47PF 50V X7R 0603	KEMET	399-C0603C470K5RACTUCT-ND	DigiKey	New - Purchase Cost Applie	\$0.23	2	\$0.46	
3.4.5	CAP CER 470PF 50V X7R 0603	KEMET	399-C0603C471K5RACTUCT-ND	DigiKey	New - Purchase Cost Applie	\$0.10	1	\$0.10	
3.4.6	CAP CER 12PF 50V X7R 0603	KEMET	399-C0603C120K5RACTUCT-ND	DigiKey	New - Purchase Cost Applie	\$0.23	4	\$0.92	
3.4.7	CAP ALUM 10UF 20% 160V RADIAL TH	Nichicon	493-12828-1-ND	DigiKey	New - Purchase Cost Applie	\$0.33	1	\$0.33	
3.4.8	DIODE ZENER 10V 500MW SOD123	MCC	BZT52C10-TPMSDKR-ND	DigiKey	New - Purchase Cost Applie	\$0.14	1	\$0.14	
3.4.9	LED GREEN CLEAR 0805 SMD	Würth Elektronik	732-4983-1-ND	DigiKey	New - Purchase Cost Applie	\$0.19	5	\$0.95	
3.4.10	LED BLUE CLEAR 0805 SMD	Würth Elektronik	732-4982-1-ND	DigiKey	New - Purchase Cost Applie	\$0.19	1	\$0.19	
3.4.11	LED RED CLEAR 0805 SMD	Würth Elektronik	732-4984-1-ND	DigiKey	New - Purchase Cost Applie	\$0.19	1	\$0.19	
3.4.12	PTC RESET FUSE 16V 1.5A 1210	Littelfuse Inc.	F6135CT-ND	DigiKey	New - Purchase Cost Applie	\$1.24	1	\$1.24	
3.4.13	CONN HEADER R/A 2POS	Molex	WM1813-ND	DigiKey	New - Purchase Cost Applie	\$0.95	1	\$0.95	
3.4.14	CONN HEADER R/A 6POS 3MM	Molex	WM1821-ND	DigiKey	New - Purchase Cost Applie	\$2.53	1	\$2.53	
3.4.15	CONN HEADER VERT APOS 1.25MM	Molex	WM1733-ND	DigiKey	New - Purchase Cost Applie	\$0.25	4	\$1.00	
3.4.16	CONN RCPT USB2.0 MICRO B SMD R/A	Würth Elektronik	732-5960-1-ND	DigiKey	New - Purchase Cost Applie	\$2.21	1	\$2.21	
3.4.17	CONN HEADER VERT 3POS 1.25MM	Molex	WM1732-ND	DigiKey	New - Purchase Cost Applie	\$0.24	7	\$1.68	
3.4.18	CONN HEADER SMD R/A APOS 1.25MM	JST Sales America Inc.	455-1566-1-ND	DigiKey	New - Purchase Cost Applie	\$0.39	4	\$1.56	
3.4.19	CONN HEADER VERT 8POS 1.25MM	Molex	WM1737-ND	DigiKey	New - Purchase Cost Applie	\$0.46	1	\$0.46	
3.4.20	CONN RCPT 6POS 0.1 GOLD PCB	Samtec Inc.	SAM1002S-ND	DigiKey	New - Purchase Cost Applie	\$0.92	4	\$3.68	
3.4.21	MOSFET P-CH 100V 37.1A 2OT52	Vishay Siliconix	SUD50P10-43L-GE3CT-ND	DigiKey	New - Purchase Cost Applie	\$3.60	1	\$3.60	
3.4.22	TRANS NPN 40V 0.2A SOT23-3	onsemi	MMBT3904LT1GOSCT-ND	DigiKey	New - Purchase Cost Applie	\$0.14	1	\$0.14	
3.4.23	MOSFET P-CH 20V 4.2A SOT23	Diodes Incorporated	DMG2305UX-TDICT-ND	DigiKey	New - Purchase Cost Applie	\$0.35	1	\$0.35	
3.4.24	MOSFET SOT23 N 80V 50HM 150C	onsemi	2N7002NCT-ND	DigiKey	New - Purchase Cost Applie	\$0.65	2	\$1.30	
3.4.25	RES 22.1 OHM 1% 1/8W 0603	Stackpole Electronics Inc	RNCP0603FTD22R1CT-ND	DigiKey	New - Purchase Cost Applie	\$0.10	5	\$0.50	
3.4.26	RES 100K OHM 1% 1/10W 0603	Stackpole Electronics Inc	RMCF0603FT100KCT-ND	DigiKey	New - Purchase Cost Applie	\$0.10	1	\$0.10	
3.4.27	RES 332 OHM 1% 1/8W 0603	Stackpole Electronics Inc	RNCP0603FTD332RCT-ND	DigiKey	New - Purchase Cost Applie	\$0.10	3	\$0.30	
3.4.28	RES 0.03 OHM 1% 1/2W 1206	Stackpole Electronics Inc	738-CSR1206FT33LOCT-ND	DigiKey	New - Purchase Cost Applie	\$0.45	3	\$1.35	
3.4.29	RES 10K OHM 1% 1/8W 0603	Stackpole Electronics Inc	RNCP0603FTD10K0CT-ND	DigiKey	New - Purchase Cost Applie	\$0.10	8	\$0.80	
3.4.30	RES 1.78K OHM 1% 1/8W 0603	Stackpole Electronics Inc	RNCP0603FTD1K78CT-ND	DigiKey	New - Purchase Cost Applie	\$0.10	1	\$0.10	
3.4.31	RES 3.3K OHM 1% 1/8W 0603	Stackpole Electronics Inc	738-RNCP0603FTD3K30CT-ND	DigiKey	New - Purchase Cost Applie	\$0.10	2	\$0.20	
3.4.32	RES 121 OHM 1% 1/8W 0603	Stackpole Electronics Inc	RNCP0603FTD121RCT-ND	DigiKey	New - Purchase Cost Applie	\$0.10	1	\$0.10	
3.4.33	SWITCH SLIDE SPOT 300MA 30V	E-Switch	EG1919-ND	DigiKey	New - Purchase Cost Applie	\$0.83	2	\$1.66	
3.4.34	IC BUFF 4.5V/5.5V 14-SOIC	Texas Instruments	296-4658-1-ND	DigiKey	New - Purchase Cost Applie	\$0.50	1	\$0.50	
3.4.35	IC PWR SWITCH P-CHAN 1.1 SC70-6	Microchip Technology	576-3490-1-ND	DigiKey	New - Purchase Cost Applie	\$0.56	1	\$0.56	
3.4.36	IC TEMP/VOLT/CUR MONITOR 10MSOP	Analog Devices Inc	505-LTC2990IMS#TRPBFCT-ND	DigiKey	New - Purchase Cost Applie	\$8.55	1	\$8.55	
3.4.37	USB 2.0 TO UART PROTOCOL CONVERT	Microchip Technology	150-MCP2200T-E/SSCT-ND	DigiKey	New - Purchase Cost Applie	\$2.61	1	\$2.61	
3.4.38	DC DC CONVERTER 5V 10W	Traco Power	1951-2692-ND	DigiKey	New - Purchase Cost Applie	\$12.24	1	\$12.24	
3.4.39	DC DC CONVERTER 3.3V 6.6W	Traco Power	1951-2426-ND	DigiKey	New - Purchase Cost Applie	\$12.29	1	\$12.29	
3.4.40	RASPBERRY PI PICO RP2040	Raspberr Pi	2648-SC0915CT-ND	DigiKey	New - Purchase Cost Applie	\$4.59	1	\$4.59	
3.4.41	IC TRANSCIEVER 1/1 8SOIC	Microchip Technology	MCP2562FDT-E/NSCT-ND	DigiKey	New - Purchase Cost Applie	\$1.29	1	\$1.29	
3.4.42	IC CAN CONTROLLER W/SPI 18SOIC	Microchip Technology	MCP2515T-E/SSOCT-ND	DigiKey	New - Purchase Cost Applie	\$2.97	1	\$2.97	
3.4.43	CRYSTAL 8.0000MHZ 12PF SMD	Diodes Incorporated	FL0800011QDICT-ND	DigiKey	New - Purchase Cost Applie	\$0.72	1	\$0.72	
3.4.44	CRYSTAL 12.0000MHZ 12PF SMD	Diodes Incorporated	FH1200004CT-ND	DigiKey	New - Purchase Cost Applie	\$0.85	1	\$0.85	
3.5 Capacitor Board									
3.5.1	Printed circuit board	JLPCB		JLPCB	New - Purchase Cost Applie	\$0.80	1	\$0.80	
3.5.2	10mF Capacitor	Cornell Dubilier Knowles	380LX103M080A052	DigiKey	New - Purchase Cost Applie	\$11.57	2	\$23.14	
3.6 Sensors & Actuators									
3.6.1	Webcams	Logitech	N/A	Amazon	New - Purchase Cost Applie	\$59.69	14	\$835.66	
3.6.2	Pixhawk 6C	Pixhawk	110055	Holybro	New - Purchase Cost Applie	\$150.99	1	\$150.99	
3.6.3	M10 GPS module	Pixhawk	12040	Holybro	Used - Purchase Cost Appli	\$43.99	1	\$43.99	
3.6.4	Livox Mid-360	Livox	N/A	Ebay	New - Purchase Cost Applie	\$838.00	1	\$838.00	
3.7 Wires and Connectors									
3.7.1	31 Pin Male Connector	TE Connectivity Deutsch Cor	HD34-24-31PT	DigiKey	New - Purchase Cost Applie	\$23.54	1	\$23.54	
3.7.2	31 Pin Female Connector	TE Connectivity Deutsch Cor	HD36-24-31ST	DigiKey	New - Purchase Cost Applie	\$28.14	1	\$28.14	
3.7.3	Deutsch Male Connector Pins	TE Connectivity Deutsch Cor	0462-201-1631	DigiKey	New - Purchase Cost Applie	\$1.61	28	\$45.08	
3.7.4	Deutsch Female Connector Pins	TE Connectivity Deutsch Cor	0460-202-1631	DigiKey	New - Purchase Cost Applie	\$1.28	28	\$35.84	
3.7.5	10 Block Wago	Phoenix Contact	1019577	DigiKey	New - Purchase Cost Applie	\$5.74	2	\$11.48	
3.7.6	24-pin panel mount (F)	JAE Electronics	SRCN2A25-24S	DigiKey	New - Purchase Cost Applie	\$11.33	1	\$11.33	
3.7.7	24-pin connector (M)	JAE Electronics	SRCN1A25-24S	DigiKey	New - Purchase Cost Applie	\$16.10	1	\$16.10	
3.7.8	16-pin panel mount (F)	JAE Electronics	SRCN2A25-16S	DigiKey	Used - Purchase Cost Appli	\$8.41	1	\$8.41	
3.7.9	16-pin connector (M)	JAE Electronics	SRCN6A25-16P	DigiKey	Used - Purchase Cost Appli	\$13.91	1	\$13.91	
3.7.10	XT30 Connector	DFRobot	FIT0586	DigiKey	New - Purchase Cost Applie	\$1.90	19	\$36.10	
3.7.11	18 awg wire (red and black) - 50ft	BNTECHGO		Amazon	New - Purchase Cost Applie	\$20.48	1	\$20.48	
3.7.12	22 awg wire (red and black) - 50ft	BNTECHGO		Amazon	New - Purchase Cost Applie	\$13.98	1	\$13.98	
3.7.13	22 awg wire (green) - 50ft	BNTECHGO		Amazon	New - Purchase Cost Applie	\$11.48	1	\$11.48	
3.7.14	22 awg wire (yellow) - 50ft	BNTECHGO		Amazon	New - Purchase Cost Applie	\$11.48	1	\$11.48	
3.7.15	22 awg wire (white) - 10ft	BNTECHGO		Amazon	New - Purchase Cost Applie	\$11.48	0.2	\$2.30	
3.7.16	22 awg wire (blue) - 10ft	BNTECHGO		Amazon	New - Purchase Cost Applie	\$11.48	0.2	\$2.30	
3.7.17	Wago - Single	WAGO	221-2401	DigiKey	New - Purchase Cost Applie	\$0.81	10	\$8.10	
3.7.18	Wago - Double	WAGO	221-412	DigiKey	New - Purchase Cost Applie	\$0.62	4	\$2.48	
3.7.19	Wago - Five	WAGO	221-415	DigiKey	New - Purchase Cost Applie	\$1.17	4	\$4.68	
3.7.20	Solder	Kester		Amazon	New - Purchase Cost Applie	\$45.00	0.5	\$22.50	
3.7.21	Heat shrink	Dhooz		Amazon	New - Purchase Cost Applie	\$5.99	1	\$5.99	
3.7.22	Zip ties	Have Me TD		Amazon	New - Purchase Cost Applie	\$7.99	0.1	\$0.80	
3.7.23	Cable tie holders	eBoot		Amazon	New - Purchase Cost Applie	\$7.85	0.5	\$3.93	
3.7.24	HDMI Cable	Adafruit Industries	2197	DigiKey	New - Purchase Cost Applie	\$3.95	1	\$3.95	
3.7.25	Micro USB to USB A	Qualtek	3025031-08	DigiKey	New - Purchase Cost Applie	\$3.64	1	\$3.64	
3.7.26	USB A Male to USB A Male	Qualtek	3021059-01M	DigiKey	New - Purchase Cost Applie	\$3.07	3	\$9.21	
3.7.27	USB A Male to USB A Female	StarTech	USBEXTAA6BK	DigiKey	New - Purchase Cost Applie	\$7.07	2	\$14.14	
3.7.28	USB A Male to USB C Male	Qualtek	3021090-01M	DigiKey	New - Purchase Cost Applie	\$5.59	4	\$22.36	
3.7.29	Molex Mega-fit 2x2 housing	Molex	1716920104	DigiKey	New - Purchase Cost Applie	\$0.72	2	\$1.44	
3.7.30	Molex Mega-fit 2x1 housing	Molex	1716920202	DigiKey	New - Purchase Cost Applie	\$0.89	2	\$1.78	
3.7.31	Molex Mega-fit crimps	Molex	768230343	DigiKey	New - Purchase Cost Applie	\$0.27	20	\$5.40	
3.7.32	Molex Mini-fit Jr 2x6 Housing	Molex	469921210	DigiKey	New - Purchase Cost Applie	\$0.80	1	\$0.80	
3.7.33	Molex Mini-fit Jr 2x3 Housing	Molex	455590002	DigiKey	New - Purchase Cost Applie	\$0.45	1	\$0.45	
3.7.34	Molex-Mini-fit Jr 2x2 housing	Molex	39013045	DigiKey	New - Purchase Cost Applie	\$0.42	2	\$0.84	
3.7.35	Molex-Mini-fit Jr crimps	Molex	433750001	DigiKey	New - Purchase Cost Applie	\$0.16	8	\$1.28	
3.7.36	Molex Mini-fit Jr 18-24 AWG crimps	Molex	39000039	DigiKey	New - Purchase Cost Applie	\$0.12	18	\$2.16	
3.7.37	Molex Micro-fit 2x6 housing	Molex	430251200	DigiKey	New - Purchase Cost Applie	\$0.86	1	\$0.86	
3.7.38	Molex Micro-fit crimps	Molex	430300008	DigiKey	New - Purchase Cost Applie	\$0.24	12	\$2.88	
3.7.39	Molex SL 2x1 housing	Molex	50579702	DigiKey	New - Purchase Cost Applie	\$0.44	3	\$1.32	
3.7.40	Molex SL crimps	Molex	16020119	DigiKey	New - Purchase Cost Applie	\$0.23	6	\$1.38	
3.7.41	Stemma Qwic JST Cables	Adafruit Industries	4401	DigiKey	New - Purchase Cost Applie	\$1.25	1	\$1.25	
3.7.42	Qwwic to I2C Cable	SparkFun	15109	DigiKey	New - Purchase Cost Applie	\$1.95	4	\$7.80	
3.7.43	USB Passthrough	Amphenol Audio	AC-USB3-AAB	DigiKey	New - Purchase Cost Applie	\$13.00	3	\$39.00	
3.7.44	HDMI Passthrough	Amphenol Audio	AC-HDMI-RRB	DigiKey	New - Purchase Cost Applie	\$10.84	1	\$10.84	
3.7.45	Ethernet Passthrough	Amphenol Audio	RJS-5EPFFP-LC7002	DigiKey	New - Purchase Cost Applie	\$8.90	1	\$8.90	
3.7.46	1/2" sheathing	Alex Tech		Amazon	Used - Purchase Cost Appli	\$14.99	0.5	\$7.50	
4 COMMAND & CONTROL AND COMMUNICATIONS SYSTEM									
4.1 Rover Communications Equipment									
4.1.1	Carbon Fiber Telescopic Pole	Doben	B0D45BDSF3	Amazon	Used - Purchase Cost Appli	\$56.99	1	\$65.99	\$2,749.46

Work Breakdown Structure Financial Report
Team Name: Team Mountaineers

WBS #	Description	Manufacturer	Part	Vendor	Cost Rule	Unit Cost	Quantity	Item Total Cost*	System Total Cost*
4.1.2	2.4 GHz to 2.5 GHz 4 dBi Omnidirectional Antenna, 6 inch pigtail with MMCX Right Angle Conne	L-Com	HGV-2404U-MMCX	L-Com	Used - Purchase Cost Appli	\$35.99	1	\$35.99	
4.1.3	4.9 GHz to 5.8 GHz 6 dBi Omnidirectional Antenna - N Type Male Connector	L-Com	HGV-4958-06JU-NM	L-Com	New - Purchase Cost Appli	\$109.99	1	\$109.99	
4.1.4	airMAX Bullet AC IP67 Radio	Ubiquiti	N/A	Ubiquiti	New - Purchase Cost Appli	\$129.00	2	\$258.00	
4.1.5	XRDS -RF 5PCS N-Female to N-Female Connector RF Coax Cable Adapter Barrel Connectors	XRDS -RF	B07Z21RXK5	Amazon	New - Purchase Cost Appli	\$4.20	2	\$8.40	
4.1.6	TP Link LS1008G LiteWave 8 Port Gigabit Ethernet Switch	TP Link	B086384H7C	Amazon	New - Purchase Cost Appli	\$15.00	1	\$15.00	
4.1.7	Passive PoE Injector and PoE Splitter Kit with 5.5x2.1 mm DC Connector	iCreatin	B00NRHNPUA	Amazon	New - Purchase Cost Appli	\$5.95	1	\$5.95	
4.1.8	Coax (1ft)	STEREN	RGX8	Amazon	New - Purchase Cost Appli	\$0.69	17	\$11.73	
4.1.9	Ethernet (1ft)	Cable Matters		Amazon	New - Purchase Cost Appli	\$0.35	10	\$3.50	
4.2	Base Station Communications								
4.2.1	Lenovo V15 G4 Laptop	Lenovo	N/A	Newegg	New - Purchase Cost Appli	\$419.99	2	\$839.98	
4.2.2	ArcticPro 22 inch 120Hz Monitor	ArcticPro	N/A	Amazon	New - Purchase Cost Appli	\$69.99	2	\$139.98	
4.2.3	Ubiquiti ROCKET-M5-GPS 5GHz Hi Power 2x2 MIMO AirMax	Ubiquiti	B00CX4T6BU	Amazon	New - Purchase Cost Appli	\$469.99	1	\$469.99	
4.2.4	Ubiquiti AM-5G19-120 AirMAX 5 GHz 2x2 MIMO Sector Antenna	Ubiquiti	BH #UBAM5G19120	B&H Photo / Video	New - Purchase Cost Appli	\$139.00	1	\$139.00	
4.2.5	Ubiquiti AM-2G16-90 AirMAX 2.4 GHz 2x2 MIMO Sector Antenna	Ubiquiti	BH #UBAM2G1690	B&H Photo / Video	Used - Purchase Cost Appli	\$139.00	1	\$139.00	
4.2.6	TP Link LS1008G LiteWave 8 Port Gigabit Ethernet Switch	TP Link	B086384H7C	Amazon	New - Purchase Cost Appli	\$15.00	1	\$15.00	
4.2.7	MEIUA All Weather Rolling Waterproof Protective Case	MEIUA	B0C1N17Y2JP	Amazon	New - Purchase Cost Appli	\$159.99	2	\$319.98	
4.2.8	Ethernet	Cable Matters	N/A	Amazon	New - Purchase Cost Appli	\$0.35	2	\$0.70	
4.2.9	100FT Outdoor Cat 6 Ethernet Patch Cable & Holder	Qcynsef	B0BZC9DVV9	Amazon	Used - Purchase Cost Appli	\$40.65	2	\$81.30	
4.2.10	24 V DC PoE Adapter	Ubiquiti	POE-24-12W-G	Ubiquiti	Used - Purchase Cost Appli	\$15.00	2	\$30.00	
4.2.11	8-Bit-Do Controller Wireless 2C Controller	8Bitdo	B0D6BF69X4	Amazon	New - Purchase Cost Appli	\$29.99	2	\$59.98	
5	ARM SYSTEM								
5.1	Arm Motors								
5.1.1	MyActuator RMD-X8-P20-120-E	MyActuator	RMD-X8-P20-120-E	RobotShop	Donated - Market Price App	\$599.00	2	\$1,198.00	
5.1.2	MyActuator RMD-X4-36	MyActuator	RMD-X4-36	RobotShop	Donated - Market Price App	\$269.00	3	\$807.00	
5.1.3	MyActuator RMD-X2-7	MyActuator	RMD-X2-7	RobotShop	Donated - Market Price App	\$199.00	1	\$199.00	
5.2	Arm Electrical and Controls								
5.2.1	Seed Studio XIAO	Seed Technology Co	102010328	DigiKey	New - Purchase Cost Appli	\$5.40	1	\$5.40	
5.2.2	Force Sensor	TE Connectivity	FX29K0-100A-0050-L	DigiKey	New - Purchase Cost Appli	\$24.71	1	\$24.71	
5.3.3	L12-R Micro Linear Servo	Actuonix	L12-30-50-6-R	Actuonix	New - Purchase Cost Appli	\$70.00	1	\$70.00	
5.3	Machined Parts								
5.3.1	Innovation Hub Parts	WVU Lane Innovation Hub	N/A	N/A	New - Purchase Cost Appli	\$1,111.42	1	\$1,111.42	
5.3.2	Oshcut Parts	Oshcut	N/A	Oshcut	New - Purchase Cost Appli	\$99.92	1	\$99.92	
5.4	Hardware								
5.4.1	15 mm Wide Guide Rail for 47 mm Wide Sleeve Bearing Carriage	McMaster-Carr	9867K12	McMaster-Carr	New - Purchase Cost Appli	\$135.00	0.76	\$102.60	
5.4.2	Sleeve Bearing Carriage	McMaster-Carr	9867K2	McMaster-Carr	New - Purchase Cost Appli	\$60.71	1	\$60.71	
5.4.3	Self-Aligning Sleeve Bearing Carriage	McMaster-Carr	4542N12	McMaster-Carr	New - Purchase Cost Appli	\$68.46	1	\$68.46	
5.4.4	Stainless Steel Lead Screw	Thompson Linear	CTL-SRA10-8X2M-24IN	Thompson Linear	New - Purchase Cost Appli	\$131.04	1	\$131.04	
5.4.5	Standard Backlash Lead Nut	Thompson Linear	MTS10-8X2M	Thompson Linear	New - Purchase Cost Appli	\$21.17	1	\$21.17	
5.4.6	Oil-Embedded 841 Bronze Flanged Sleeve Bearing	McMaster-Carr	6659K115	McMaster-Carr	New - Purchase Cost Appli	\$2.43	2	\$4.86	
5.4.7	Ball Bearing Double Rubber Sealed Miniature Deep Groove 608rs	ANCIRS	N/A	Amazon	New - Purchase Cost Appli	\$9.99	0.3	\$3.00	
5.4.8	Steel Ball Bearing	McMaster-Carr	5972K246	McMaster-Carr	New - Purchase Cost Appli	\$12.80	2	\$25.60	
5.4.9	Standard Hockey Shaft - Senior Flex 85	Alkali	ACISH	Ice Warehouse	New - Purchase Cost Appli	\$99.99	1.5	\$149.99	
5.4.10	F608-2RS Flanged Ball Bearing	M METERXITY	mma250228y020403jp	Amazon	New - Purchase Cost Appli	\$16.89	0.10	\$1.69	
5.4.11	Aluminum Unthreaded Spacer	McMaster-Carr	94669A118	McMaster-Carr	New - Purchase Cost Appli	\$1.87	2	\$3.74	
5.4.12	3M Scotch-Weld Epoxy Adhesive DP420, Black, Two-Part Epoxy Structural Adhesive, 50 ml	3M	62277814364	Amazon	New - Purchase Cost Appli	\$38.50	0.25	\$9.63	
5.4.13	Flanged Ball Bearing	McMaster-Carr	57155K622	McMaster-Carr	New - Purchase Cost Appli	\$14.29	1	\$14.29	
5.4.14	High-Strength 932 Bronze Flanged Sleeve Bearing	McMaster-Carr	5448T412	McMaster-Carr	New - Purchase Cost Appli	\$9.50	1	\$9.50	
5.4.15	Architectural 6063 Aluminum U-Channel	McMaster-Carr	9001K887	McMaster-Carr	New - Purchase Cost Appli	\$28.25	0.18	\$5.22	
5.4.16	Tight-Tolerance High-Strength 7075 Aluminum Rod	McMaster-Carr	9403T54	McMaster-Carr	New - Purchase Cost Appli	\$36.54	1	\$36.54	
5.4.17	High-Load Ball Linear Bearing	McMaster-Carr	6232K31	McMaster-Carr	New - Purchase Cost Appli	\$32.51	1	\$32.51	
5.4.18	3508 Series Lead Screw Nut for V-Guide (8mm Lead, 4 Start, 14mm Width, 32mm Height)	ServoCity	3508-0804-1432	ServoCity	New - Purchase Cost Appli	\$9.99	1	\$9.99	
5.4.19	3501 Series Lead Screw (8mm Lead, 4 Start, 250mm Length)	ServoCity	3501-0804-0250	ServoCity	New - Purchase Cost Appli	\$8.99	1	\$8.99	
5.4.20	M5x10mm torx	McMaster-Carr	90991A126	McMaster-Carr	New - Purchase Cost Appli	\$11.88	0.08	\$0.95	
5.4.21	M5x25mm torx	McMaster-Carr	90910A581	McMaster-Carr	New - Purchase Cost Appli	\$10.43	0.16	\$1.67	
5.4.22	M4x8mm torx	McMaster-Carr	90991A121	McMaster-Carr	New - Purchase Cost Appli	\$7.20	0.02	\$0.14	
5.4.23	M4x10mm torx	McMaster-Carr	90991A122	McMaster-Carr	New - Purchase Cost Appli	\$6.64	0.28	\$1.86	
5.4.24	M4x12mm torx	McMaster-Carr	90991A123	McMaster-Carr	New - Purchase Cost Appli	\$9.36	0.04	\$0.37	
5.4.25	M4x25mm torx	McMaster-Carr	90910A579	McMaster-Carr	New - Purchase Cost Appli	\$14.97	0.07	\$1.05	
5.4.26	M4x25mm black-oxide hex	McMaster-Carr	91290A176	McMaster-Carr	New - Purchase Cost Appli	\$10.41	0.4	\$4.16	
5.4.27	M4x30mm black-oxide hex	McMaster-Carr	91290A180	McMaster-Carr	New - Purchase Cost Appli	\$10.37	0.08	\$0.83	
5.4.28	M3x6mm torx	McMaster-Carr	90991A112	McMaster-Carr	New - Purchase Cost Appli	\$4.36	0.05	\$0.22	
5.4.29	M3x6mm hex	McMaster-Carr	92125A126	McMaster-Carr	New - Purchase Cost Appli	\$6.85	0.04	\$0.27	
5.4.30	M3x8mm torx	McMaster-Carr	90991A113	McMaster-Carr	New - Purchase Cost Appli	\$4.84	0.37	\$1.72	
5.4.31	M3x10mm torx	McMaster-Carr	90991A114	McMaster-Carr	New - Purchase Cost Appli	\$5.16	0.06	\$0.31	
5.4.32	M3x12mm torx	McMaster-Carr	90991A115	McMaster-Carr	New - Purchase Cost Appli	\$6.24	0.1	\$0.62	
5.4.33	M3x14mm torx	McMaster-Carr	92832A566	McMaster-Carr	New - Purchase Cost Appli	\$10.09	0.1	\$1.01	
5.4.34	M3x16mm torx	McMaster-Carr	90910A573	McMaster-Carr	New - Purchase Cost Appli	\$12.71	0.1	\$1.27	
5.4.35	M3x30mm torx	McMaster-Carr	92832A567	McMaster-Carr	New - Purchase Cost Appli	\$14.25	0.1	\$1.43	
5.4.36	M3x35mm torx	McMaster-Carr	90910A576	McMaster-Carr	New - Purchase Cost Appli	\$14.97	0.5	\$7.49	
5.4.37	Alloy Steel Shoulder Screws - Long	McMaster-Carr	92981A753	McMaster-Carr	New - Purchase Cost Appli	\$4.07	1	\$4.07	
5.4.37	Alloy Steel Shoulder Screws - Midsize	McMaster-Carr	92981A103	McMaster-Carr	New - Purchase Cost Appli	\$1.72	2	\$3.44	
5.4.38	18-8 Stainless Steel Shoulder Screw	McMaster-Carr	90285A577	McMaster-Carr	New - Purchase Cost Appli	\$8.30	1	\$8.30	
5.4.39	M3 Pin	McMaster-Carr	93890A724	McMaster-Carr	New - Purchase Cost Appli	\$8.78	1	\$8.78	
5.4.40	M4 Locknuts	McMaster-Carr	93825A150	McMaster-Carr	New - Purchase Cost Appli	\$7.03	0.1	\$0.70	
5.4.41	M3 Locknuts	McMaster-Carr	90576A102	McMaster-Carr	New - Purchase Cost Appli	\$5.55	0.5	\$2.78	
5.4.42	M5 Heat Inserts	McMaster-Carr	94180A361	McMaster-Carr	New - Purchase Cost Appli	\$0.36	4	\$1.43	
5.4.43	M4 Heat Inserts	McMaster-Carr	94180A351	McMaster-Carr	New - Purchase Cost Appli	\$0.22	3	\$0.65	
5.4.44	M3 Heat Inserts	McMaster-Carr	94180A331	McMaster-Carr	New - Purchase Cost Appli	\$0.20	2	\$0.41	
6	SCIENCE PAYLOAD								
6.1	Sensors								
6.1.1	ST-VIS Miniature Spectrometer	OceanOptics	ST-VIS	OceanOptics	Used - Purchase Cost Appli	\$1,650.00	1	\$1,650.00	
6.1.2	QWIG SOIL MOISTURE SENSOR	SparkFun Electronics	1568-SEN-24409-ND	DigiKey	New - Purchase Cost Appli	\$6.95	1	\$6.95	
6.1.3	TEMP SENSOR WTRPRF DS18B20 11050	SparkFun Electronics	1568-11050-ND	DigiKey	New - Purchase Cost Appli	\$11.25	1	\$11.25	
6.1.4	QWIG ENVIRONMENTAL BME680	SparkFun Electronics	1568-16466-ND	DigiKey	New - Purchase Cost Appli	\$22.95	2	\$45.90	
6.2	Hardware								
6.2.1	Graduated HDPE Plastic Bottle 4 FL oz/120 ml Capacity, 2-1/8" Wide	McMaster-Carr	4113173	McMaster-Carr	New - Purchase Cost Appli	\$3.70	2	\$7.40	
6.2.2	10ft, Green, Fb70-PVC Soft Plastic Tubing for Air&Water 2 mm ID, 6 mm OD	McMaster-Carr	8014N14	McMaster-Carr	New - Purchase Cost Appli	\$9.40	0.1	\$0.94	
6.2.3	10ft, Blue, Fb70-PVC Soft Plastic Tubing for Air&Water 2 mm ID, 6 mm OD	McMaster-Carr	8014N14	McMaster-Carr	New - Purchase Cost Appli	\$9.40	0.1	\$0.94	
6.2.4	SBR Rubber Grommet for 21/32" Hole Diameter and 1/16" Material Thickness	McMaster-Carr	9600K212	McMaster-Carr	New - Purchase Cost Appli	\$8.16	1	\$8.16	
6.2.5	Peristaltic Pumps	Pinhaljing	B08FFZV2Q3	Amazon	New - Purchase Cost Appli	\$21.99	2	\$43.98	
6.2.6	Brand Polystyrene (PS) Cuvettes, 100/PK	BrandTech	N/A	Amazon	New - Purchase Cost Appli	\$23.87	1	\$23.87	
6.2.7	Flanged Ball Bearing with Steel Ring, Shielded, for 15 mm Shaft Diameter, 5 mm Wide	McMaster-Carr	4390N166	McMaster-Carr	New - Purchase Cost Appli	\$29.21	1	\$29.21	
6.2.8	Flanged Ball Bearing with Steel Ring, Shielded, for 30 mm Shaft Diameter, 7 mm Wide	McMaster-Carr	4390N181	McMaster-Carr	New - Purchase Cost Appli	\$45.44	1	\$45.44	
6.2.9	Machined & Sheet Metal Soli Collection Drum Components	WVU Lane Innovation Hub	N/A	N/A	New - Purchase Cost Appli	\$334.43	1	\$334.43	
6.2.10	OshCut Science Components	Machined Parts	N/A	OshCut	New - Purchase Cost Appli	\$90.54	1	\$90.54	
6.3	Actuators								
6.3.1	Actuonix Linear ActuatorP16-200-64-12-R	Actuonix	P16-200-64-12-R	Actuonix	New - Purchase Cost Appli	\$110.00	1	\$110.00	
6.3.2	VIBRATION ERM MTR 3400 RPM 8.4G	Vytronics Inc	1670-VJQ24-35K270B-ND	Digikey	New - Purchase Cost Appli	\$6.03	1	\$6.03	
6.3.3	Dynamixel 2XL430-W250-T	Robotis	2XL430-W250-T	Robotis	New - Purchase Cost Appli	\$126.98	1	\$126.98	
6.3.4	Dynamixel XL430-W250-T	Robotis	XL430-W250-T	Robotis	New - Purchase Cost Appli	\$27.50	6	\$165.00	
6.3.6	MyActuator X4-36 Motor	MyActuator	RMD X4-36	RobotShop	Donated - Market Price App	\$269.00	1	\$269.00	
6.4	Chemicals								
6.4.1	Resazurin Sodium Salt (1g)	Sigma-Aldrich	R7017-1G	Fisher Scientific	New - Purchase Cost Appli	\$44.10	1	\$44.10	
6.4.2	Methylene Blue (25g)	Thermo Scientific Chemicals	AAA1817414	Fisher Scientific	New - Purchase Cost Appli	\$53.70	1	\$53.70	
6.4.3	Ninhydrin (10g)	Sigma-Aldrich	N4876-10G	Fisher Scientific	New - Purchase Cost Appli	\$75.70	1	\$75.70	
6.5	Electronic Devices								
6.5.1	Simba Lighting Halogen 10 Watt 120lm Bi-Pin Bulb	Simba Lighting	902-0132-000	Amazon	Used - Purchase Cost Appli	\$0.80	1	\$0.80	

Work Breakdown Structure Financial Report
Team Name: Team Mountaineers

WBS #	Description	Manufacturer	Part	Vendor	Cost Rule	Unit Cost	Quantity	Item Total Cost*	System Total Cost*
6.5.3	QTPy Board	Adafruit Industries	4960	DigiKey	New - Purchase Cost Applie	\$4.95	1	\$4.95	
6.5.4	Stepper Motor Controller Board	AOICRIE	N/A	Amazon	New - Purchase Cost Applie	\$2.48	1	\$2.48	
6.5.5	Relays 3.3v	Teyliten	N/A	Amazon	Used - Equivalent Item Cos	\$2.60	2	\$5.20	
6.5.6	UZD2	Robotics	902-0132-000	Robotics	Used - Purchase Cost Appli	\$35.07	1	\$35.07	
6.5.7	UZD2 Power Hub Board	Robotics	902-0145-001	Robotics	Used - Purchase Cost Appli	\$21.85	1	\$21.85	
7	MISCELLANEOUS PARTS								\$485.80
7.1	Miscellaneous Parts								
7.1.1	PETG Pro Blue and Gray	Elegoo		Elegoo	New - Purchase Cost Applie	\$13.99	5	\$69.95	
7.1.2	OVERTURE TPU Filament 1.75mm Flexible Roll	OVERTURE		Amazon	New - Purchase Cost Applie	\$18.62	3	\$55.86	
7.1.3	SanDisk 2TB Extreme PRO Portable SSD V2	SanDisk		B&H Photo Video	New - Purchase Cost Applie	\$359.99	1	\$359.99	