Version 5.2

						State Based Current(mA)				Time in State(hrs/day)							
Name	Description	Quantity	Nominal Voltage	Input V Regulation(VIH)	Output V Variation(VOH)	High Expected	High Measured	Low Expected	Low Measured	High	Low	Total Consumption/Cycle(mA*hrs)	Total Energy/Cycle (mW*hrs)	Power%	Datasheet link	Comments	Versioning	Power
LiPo Battery Charger	Charger	1	11.1	100-240V AC (From outlet)		1-10A adjustable							100000 (when using AC input)		https://www.max	With current battery, should take 61 minutes to fully charge from 83% depleted while auto-balancing cell 100W charging power max	-Redid motor test and power with new ESC	Microcontroller, Microproccesor, and Oscillators
LIPO 11.1V 3S 11000mAh	Battery	1	11.1		9.6-12.6V							-9166.66	101750		https://www.max	83% of 11000mAh discharge for max current 40C discharge rating, 440A max discharge current 5C charge rating, 48.5A max charge current 3.2 per cell cutoff voltage(9.6V total) 4.2 per cell max voltage(12.6V total)	-Verified IMU, Altimeter, RC receiv GPS, and Microcontroler power	Sensors
uC32	Microcontroller	1	5	(VDD) 2.3-3.6V (Cannot go lower than 1.75V, unless it will lose RAM data) (I/O) 2.64-3.6V VIH 0-.66V VIL	2.4 - 3.6V VOH 0-.4V VOL	75.5	60	0	0	1	0	60	300	0.29%	https://drive.gooc	60mA current tested running servo code	- Added column for tested and verified current for each part	Actuators
Raspberry Pi 3B+	Microprocessor (VBAT)	1	5	2.5-5.25V	N/A	1200	500	0	0	1	0	500	2500	2.46%	https://www.raspi	Using 5V 1.2A maximum current draw specifications datasheet		
AKK KC03	Camera/Transmitter	1	11.1	7-20V	Supplies 5V Vout for Camera	340	312	0	0	1	0	312	3463.2	3.40%	https://www.am	Supply current for transmitter too		
FS-iA6B Receive	RC Receiver	1	5	4-6.5V	N/A	20	34	0	0	1	0	34	170	0.17%	https://www.ama	Tested receiving 30mA current constant for receiving		
Serial Telemetry Transmitter	Data Transmitter	1	5	5V	N/A	100	100	0	0	1	0	100	500	0.49%	https://www.spar	100mA current needed for transmitting at 20dBm		
MPL3115A2	Pressure/Temperature Sensor	1	3.3	(VDD)1.95-3.6V (VDDIO)1.62-3.6V (I/O) 2.475-3.3V VIH 0-.99V VIL	2.97-3.3V VOH 0-.33V VOL	0.2	0.16	0	0	1	0	0.16	0.528	0.00%	https://drive.gooc	Typical current needed during Acquisition/Conversio of data in high resolution mode		
HC-SR04	Ultrasonic	4	5	(VDD) 5V (Trigger)2-5V	2-5V	15	2	0	0	1	0	8	40.844	0.04%	https://drive.gooc	Current needed for each 4 sensors running for whol cycle, added power for PWM usage by sensors to re data at 16hz (.844mW)		
MTK 3339	GPS Module	1	3.3	(VDD)3-4.3V (VDDBackup)2-4.3V (I/O) 2-3.3V VIH 0-.8V VIL	2.4-2.8V VOH 0-.4V VOL	25	25	20	20	0.01	0.99	20.05	66.1759	0.07%	https://drive.gooc	25mA(Tested) Acquisition of GPS Signal takes 30s r 20mA supply current for Tracking, adds 1.09mW for continuous UART power usage		
ICM-20948	IMU 9DoF IC	1	3.3	(VDD)1.71-3.6V (VDDIO) 1.71-1.95V (I/O) 1.35-2.3V VIH 0-.54V VIL	1.62-1.8V VOH 0-.18V VOL	3	3	0	0	1	0	3	9.9	0.01%	https://drive.gooc	Typical current during data acquisition in 9-axis mod		
MPRLS0001PG00001C	Pressure sensor	1	3.3	(VDD)1.8-3.6V (I/O) 0-.66V VIL 2.64-3.3V VIH	0-.66V VOL 2.64-3.3V VOH	4	4	0	0	1	0	4	13.2	0.01%	https://sensing.ho	Tested to receive 3mA max while on		
2600Kv	Motor	4	11.1	6.4-12.6V	N/A	4086	4086	1787	1787	1	0	16344	181418.4	178.30%	B08KRRWM7F?s	Depends on how much time drone is rising, 2x hove at full throttle, .125g of thrust per motor to hover Also took into account 85% motor efficiency(Brushle See motor Power section		
RC Sail Winch Servo	Servo	4	5	4.8-6V	N/A	350	350	3	1	0	1	12	60	0.06%	https://www.ebay	Depends on how much time drone is turning, Current ranges from 3-350mA, depending on how m the drone is turning		
			11.1			Total Difference	742.54					17397.21	188542.2479					
			Max Voltage									Total mAh	Total mWh					

Power Rails	Items	Voltage(V)	Average Dropout Voltage(V)	Max Current(mA)	Max Regulated Current(mA)	Max Heat Dissipation(mW) Due to Regulators Time Dependent	Max Heat Dissipation(mW)	Comments
Rail 1	3	11.1 Nominal (Ranges from 12.6-9.6V)	0	12906	N/A	661	661	Heat comes from 7.5ft wires to and from each motor 1.588 ohms per 1000 feet 14AWG at 4.342A max
Rail 2	1	5	6.1	1400	5000	11	1235	5V switching regulator for servos, 85% minimum efficiency
Rail 3	5	3.3	1.7	41	800	70	70	3.3V Regulator used on microcontroller
Rail 6	5	5	6.1	750	5000	662	662	Same 5V Switching Regulator used for every other 5V part 85% efficient
						1403		
						Maximum Total Power lost to Heat(mWh)		

Insert Flight Time Here(Hours)
1
Insert Percentage of time at high throttle here(0-1)
1
Insert Turning time percentage here(0-1)
0

Final Battery Calculation	Results	
Total Energy Needed(mWh)	189,945.53	
Battery 83% discharge limit(mWh)	101750	
Battery Condition	Out of Battery	
Power Used by Motors(mWh)	181,418	95.51%
Power Used by Servos(mWh)	60	0.03%
Power Used by Everything Else(mWh)	7064	3.72%
Power Lost to Heat Else(mWh)	1,403	0.74%