EQUIPMENT LIST AND POWER REQUIREMENTS

Components	Voltage	Max Current (A)	Power (W)
T100 Thruster (each)	12V	11.5	130
Raspberry Pi 3B	5V	2.5	12.5
ESP32	5V	0.1	0.5
RPLiDAR A1M8	5V	0.5	2.5
DFRobot GNSS Module	5V	0.04	0.2
SG92R Mini Servo	5V	1.0	10
Waterproof Ultrasonic Sensors	5V	0.015	0.15
HC-SR04 Ultrasonic Sensors	5V	0.015	0.15
Telemetry Radio	5V	0.1	0.5
Voltage Detection Sensor	5V	0.01	0.05
Current Sensor (ACS712)	5V	0.01	0.05
IMU Module	5V	0.1	0.5

TOTAL POWER REQUIREMENT CALCULATION

PROPULSION (THRUSTERS ONLY)
- $2 \times$ T100 Thruster: $11.5A \times 2 = 23A$ at $12V = 260W$

ELECTRONICS (ALL SENSORS, PI, LIDAR, ETC.)
- Total Max Current (5V rail): ~4A (rounded up for safety)
- Converted to 12V (allowing for buck converter efficiency ~85%):
  - $5V \times 4A = 20W$; $20W / 0.85 \approx 24W$ at $12V$
  - $24W / 12V \approx 2A$ at $12V$

TOTAL SYSTEM
- Total Max Current: 23A (thrusters) + 2A (electronics) = 25A at 12V
- Total Max Power: $260W + 24W = 284W$

BATTERY AND ESTIMATED RUNTIME
- Battery: 12.8V 30Ah LiFePO4
- Total Energy: $12.8V \times 30Ah = 384Wh$

ESTIMATED RUNTIME
- At Full Load (all systems at max):
  - Runtime = 30Ah / 25A $\approx$ 1.2 hours (about 1 hour 12 minutes)
- At Typical Load (partial throttle, average 12A total):
  - Runtime = 30Ah / 12A $\approx$ 2.5 hours