

Grand Canyon Alternative Motor Project

University of Utah

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Generator/Controls

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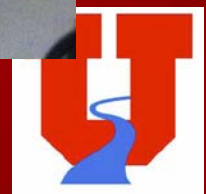
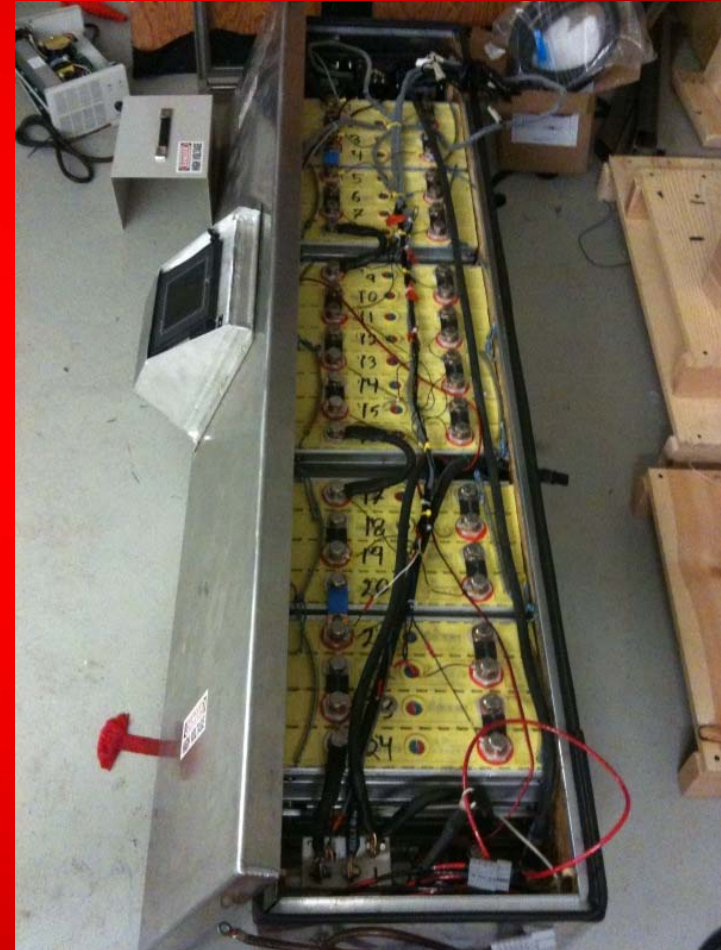
Current Progress

- Reconstructed battery after last years trip
- Acquired generator and got it running
- Redesigned charging method with generator as charge source
- Researched and acquired circuits for battery balancing system



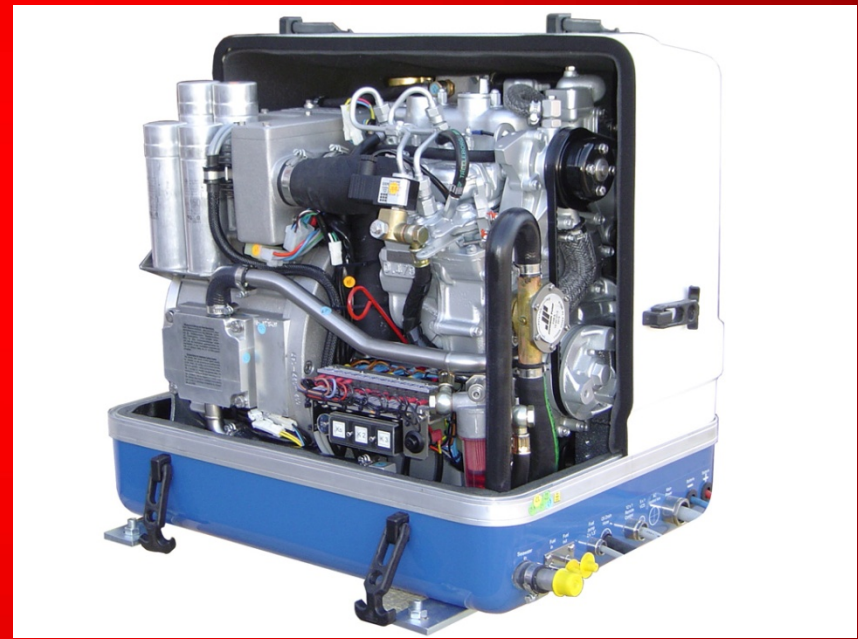
Battery Specs

- Li-ion Batteries
- 24 3.2 Volt cells in series for a 72 volt total
- Motor requires 310 Amps at full throttle
- Battery life varies



Generator Specs

- Panda AGT 6000 Marine Generator
- 120 Volt DC output
- Three hour battery charge time
- Emits 80 decibals of sound



What's Next...

- Cooling System
- Battery Charge Balancer
- Integration of control system with generator
- Reduction in noise levels
- Expansion of box



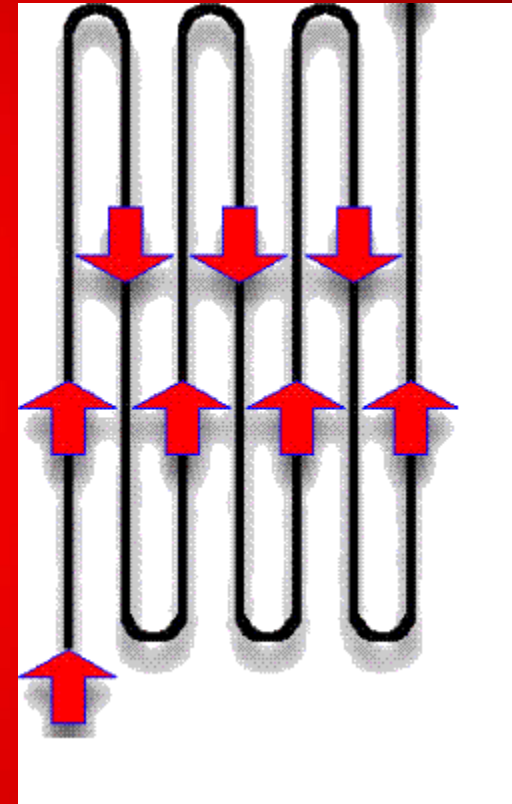
Cooling System

- Last year's team reported overheating in the battery box
- Overheating can:
 - Cause battery failure
 - Reduce battery life
 - Cause controller to fail



Proposed Cooling System

- Must keep temperature below 65° C
- Cooling system in lid:
 - Uses river water as coolant
 - location in lid separates water from batteries
- Fans used to circulate air throughout battery casing



Battery Balance

- Extends battery life
- Prevents overcharging and undercharging
- Prevents premature failure of batteries
- Prevents overheating of batteries



Balancing Systems

- Passive balancing systems
 - - Simpler circuit
 - - Drains battery life
- Active balancing systems
 - - More complex circuit
 - - Does not drain battery life



Generator

- Quiet generator by reducing vibrations
- Perform test to determine fuel consumption



Reducing Vibration

Adding a shock and vibration absorber would greatly reduce the noise.

A case will be constructed to house the generator.



Sound Limitations

- The river can vary anywhere from 40-60 Decibels
- We hope to keep the generator below 50 decibels.



Integration

- Generation will be hands free
- Ideally generator will only run at night, with noise masked by the river
- If charge of batteries reaches 20%, generator will turn on automatically



Schedule

- February 15th - Battery balance system and battery case revision
- February 25th – Noise Reduction and cooling system prototype
- March 8th – Cooling system and initial controls programming

