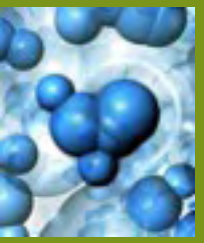

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Clarkson University Electric Knights

Leif Amber, J.D. DiGiacomandrea, Rob Franklin, Josh Gale, Scott Keefe, Peter Kudrewicz, Brian Loggi, Tom Masse, Jeannie Piekarz, Tim Swyka

Appeal

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- Quiet
- Potential access to previously restricted parks/land
- Don’t smell of gas/oil

Performance

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- Improved traction
- Instant torque
- Quick
- Center of gravity

Ergonomics

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- Seat comfort
- Maneuverability
- Switches similar to stock

Dealers

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- Alternative to gas powered snowmobiles
- Expands selection
- Entry into niche markets

Design and Cost

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- Tradeoff between cost and endurance
- Design to make for an easy transition
- BMS helps maintain battery integrity
- Operable by riders of different experiences

Environmental

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- No emissions
- Almost no noise
- Lightweight

Batteries

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- Lithium polymer
- Very linear discharge rate
- Total of 168 volts

	SLA	NiCd	NiMH	Li-ion	Li-polymer
Operating Voltage (V)	2	1.2	1.2	3.6	3.6
Energy Density	35 Wh/kg	40 Wh/kg	70 Wh/kg	175 Wh/Kg	175 Wh/kg
Cycle Life	500-800	500-1000	500-1000	500	500
Advantage	Cost	High drain rates	Good value	High Energy density	Thin form factor
Disadvantage	Low capacity	Low capacity	Venting	Complicated Packs	Expensive

Battery Management System

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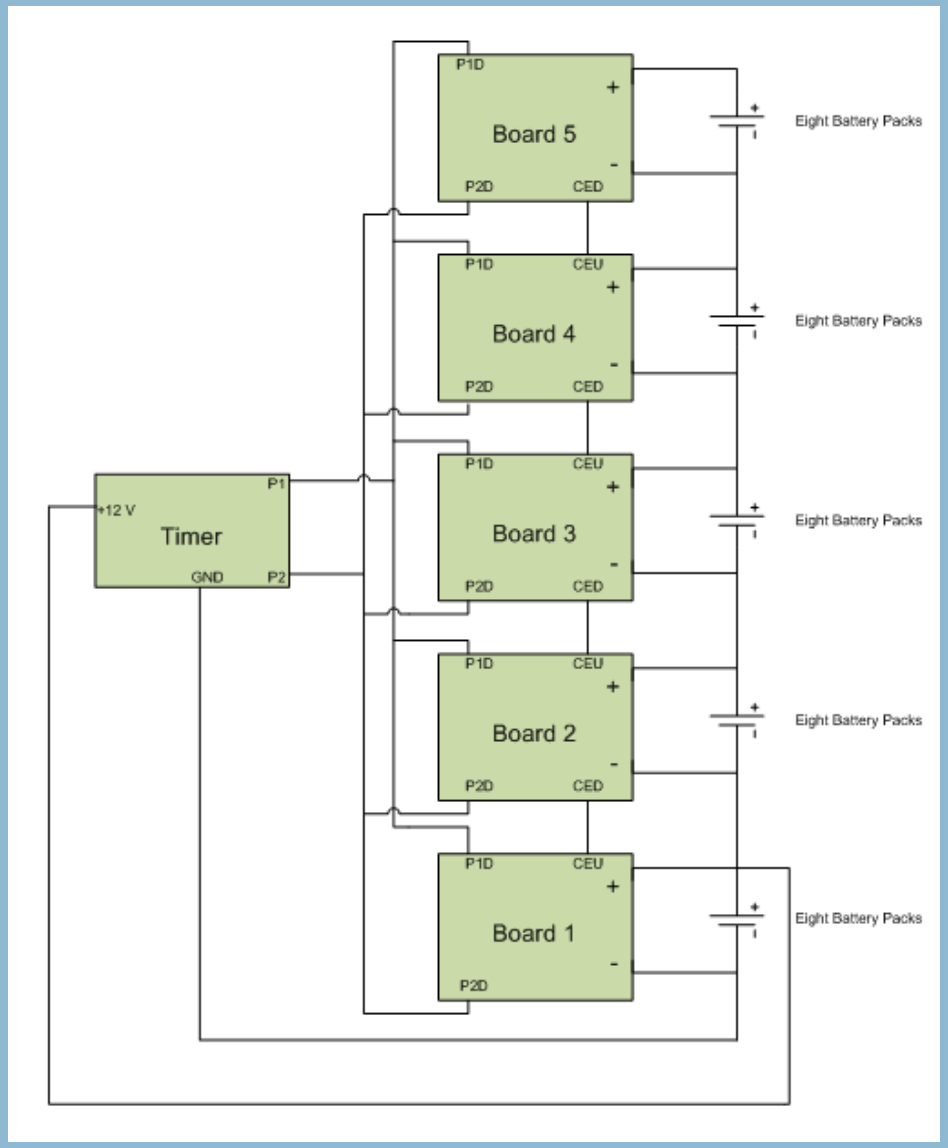

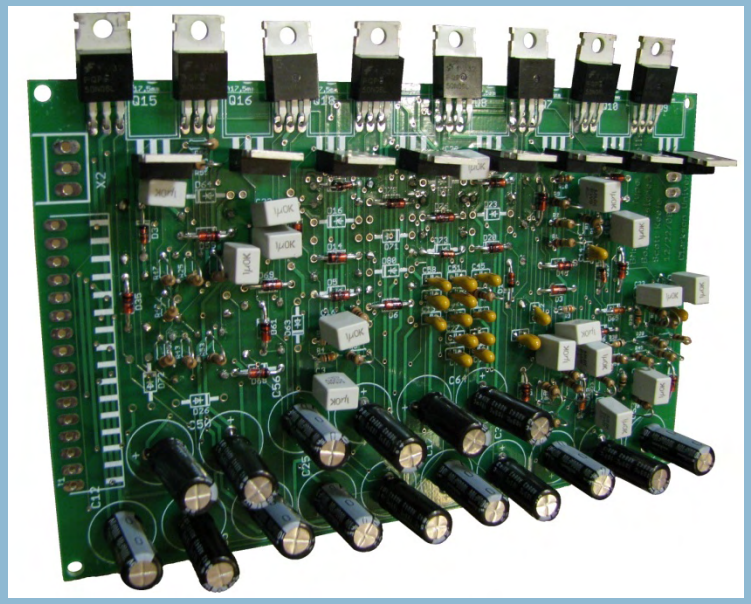

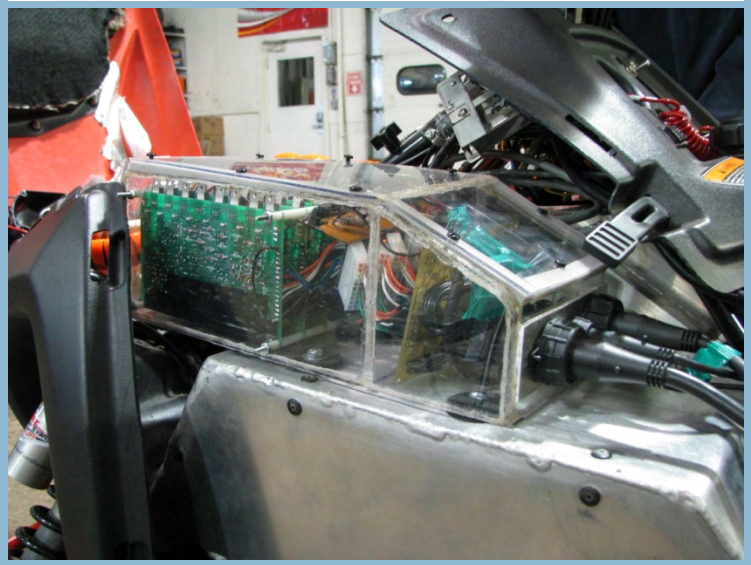

Charging

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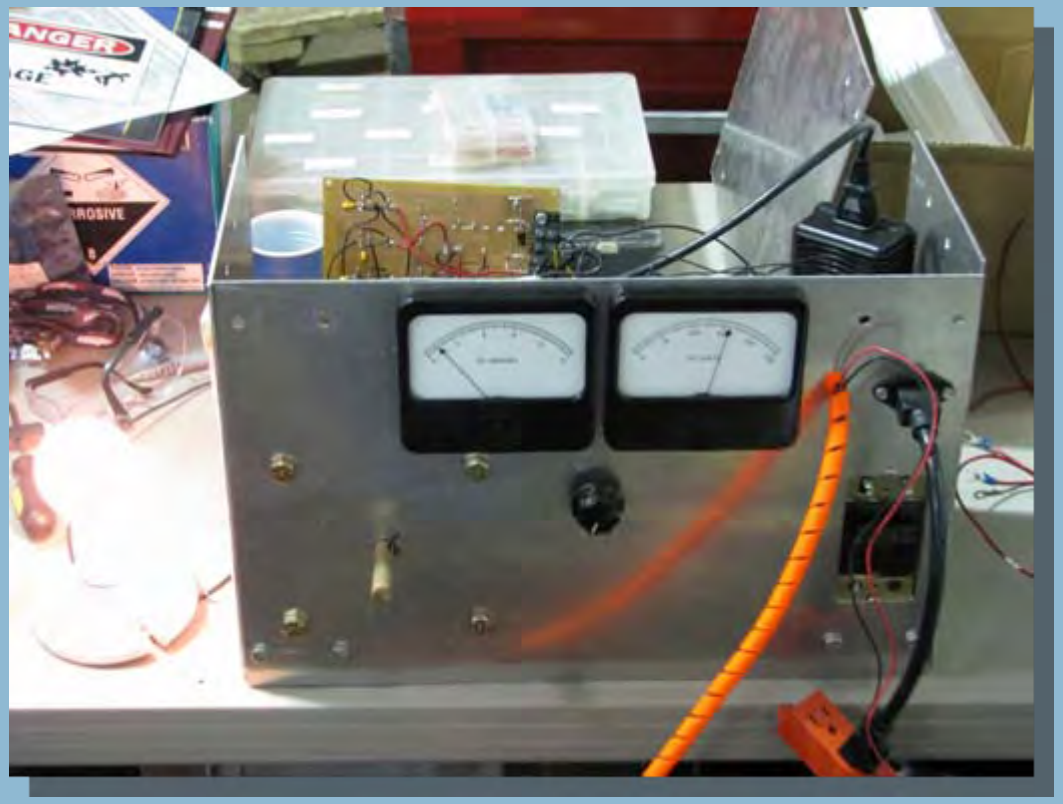
- Custom built charger
- Charges at a safe pace for the batteries
- Easy to use



Motor/Controller

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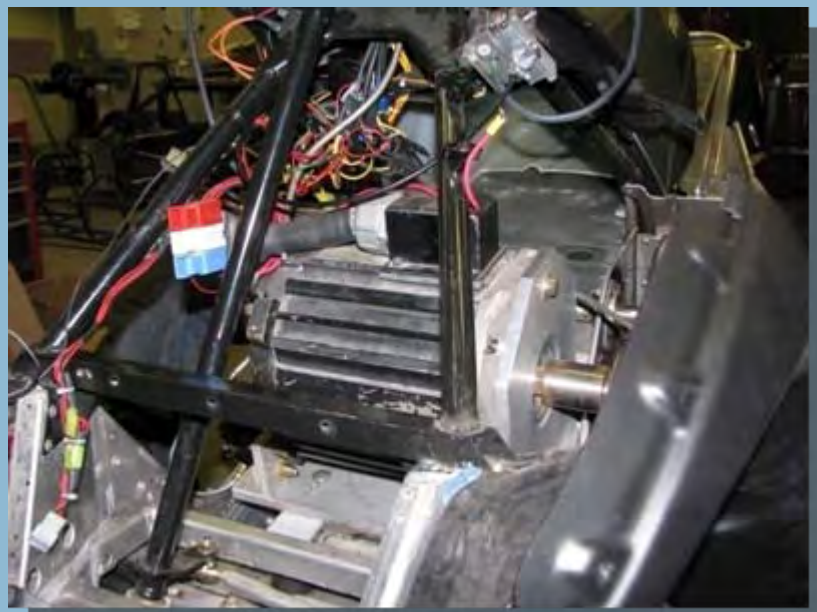
- Solectria AC21-a 3-phase AC motor
- Azure Dynamics DMOC 445 controller



Drive System

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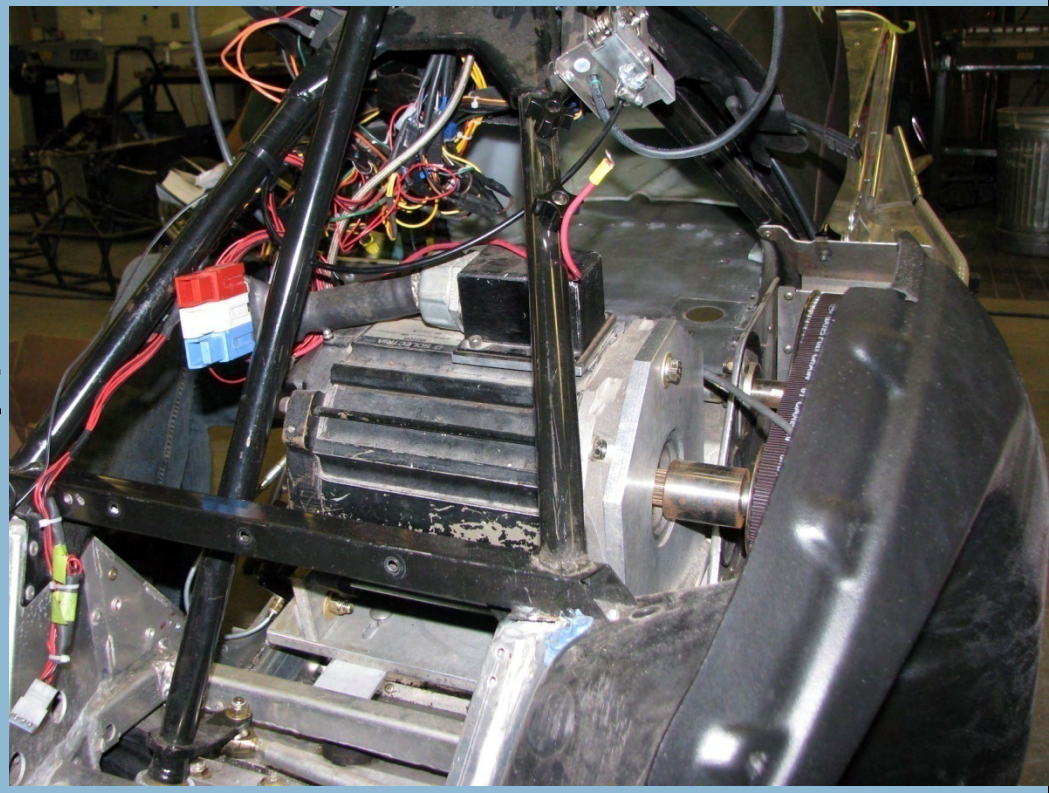
- Fixed drive
- ~2.5-1 overall gear ratio
- Gates Polychain belt



Traction

- Camoplast Cobra
- 48 Woody's studs
- Camoplast skis
- Center of gravity

Test Results

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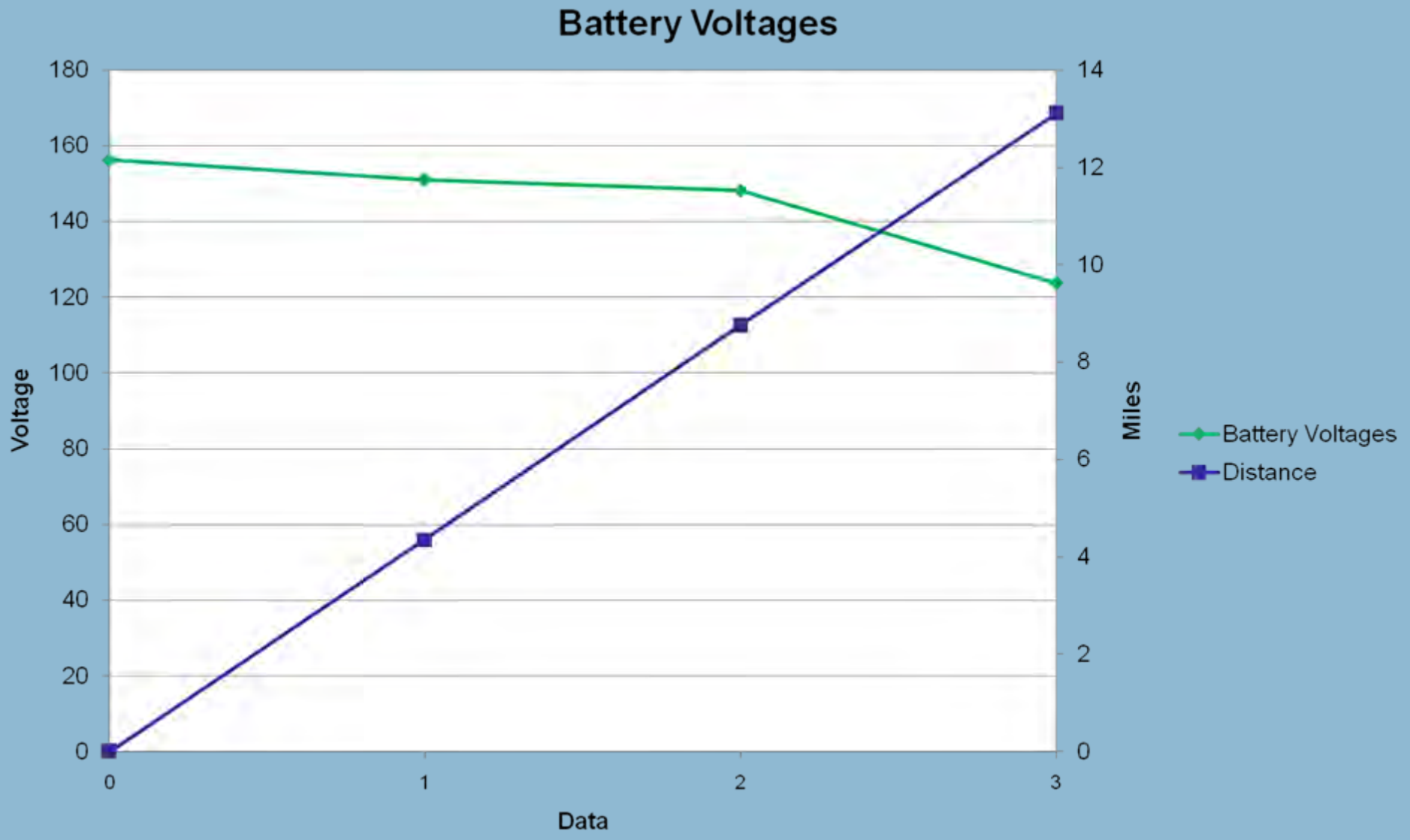

Conclusion

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Electric snowmobiles may still remain relatively expensive as a result of battery technology, however they will appeal to niche markets and their energy consumption is more efficient than internal combustion sleds.

Thank You!

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