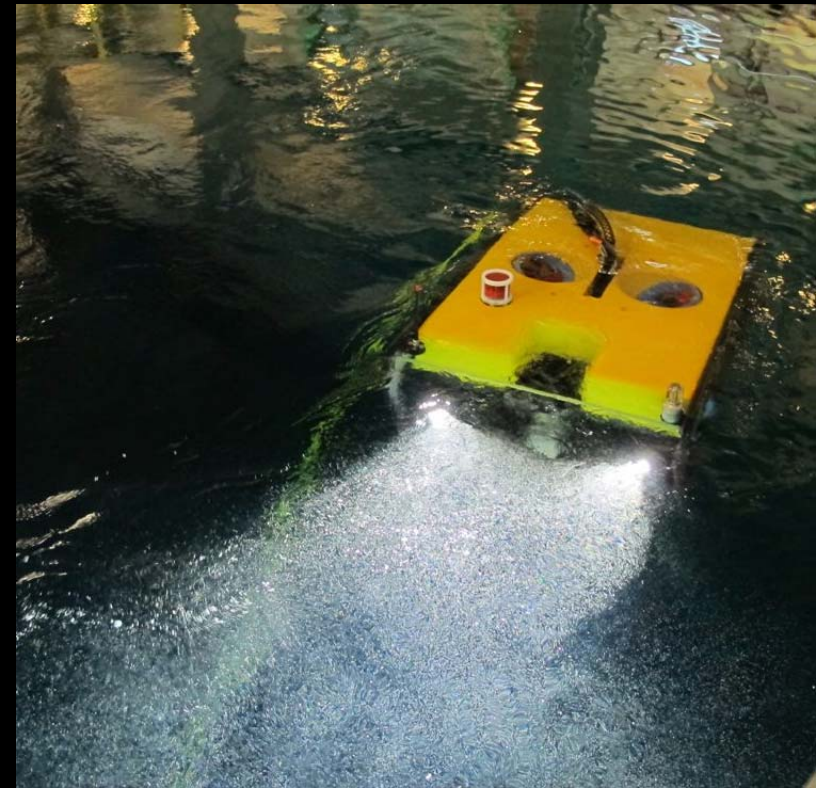


Mini ROV Upgrades

901300

Status of Mini ROV

- Vehicle sea trials completed May 2012
- Successful Arctic cruise Sept 2012
 - completed 8 dives and almost 18 hours of bottom time
- The upgraded vehicle was shipped back to Arctic June 2013 for Sept cruise



Status of Mini ROV Upgrade Project

Upgrade	Status
5-function manipulator	Complete
Control room van	Complete
DVL integration	Complete
Core vehicle upgrades	Most complete
Midwater Sampler	Expected completion 12/2013
Neutral umbilical	Expected completion 12/2013



Status of Mini ROV Upgrade Project

- Only two proposed core vehicle improvements may not be complete by the end of 2013:
 - Winch level-wind
 - Thruster power upgrade

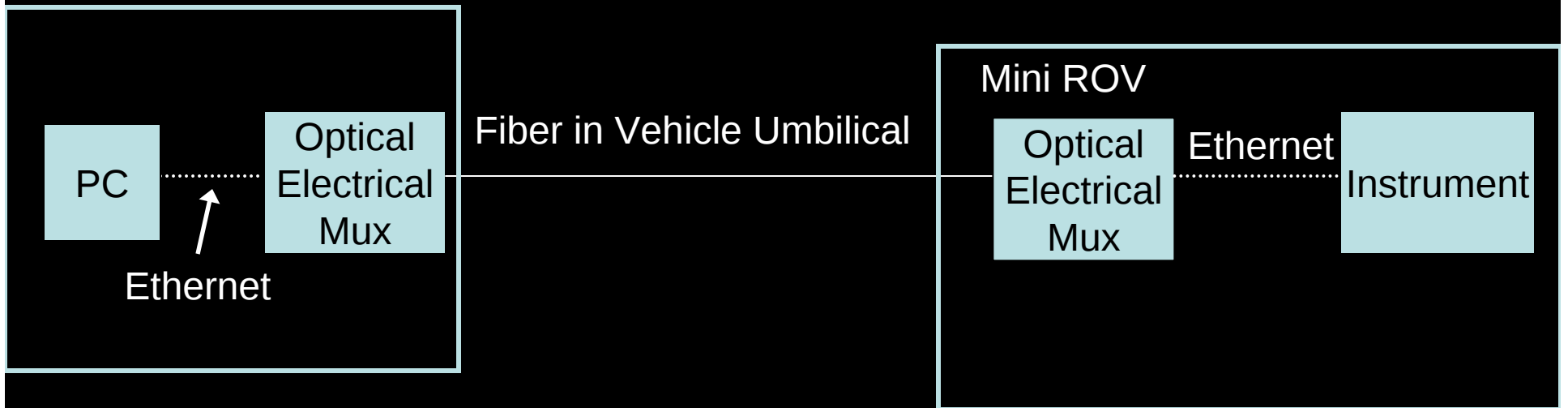
Upgrades to support proposed projects for 2014:

- Addition of GigE for high data throughput
- Purchase of a generator to power the vehicle on ships of opportunity
- A workshop van to complement the control room van
- Purchase of a portable USBL tracking system
- General maintenance and minor refinements

Proposed Improvements: Gigabit Ethernet

- The addition of Gigabit Ethernet would enable Bruce Robison's proposed work in Australia. That proposal calls for the integration of a combined acoustic and optical package, which the current vehicle configuration (serial instruments only) does not have the bandwidth to support.
- Cost: ~\$15,000
- Labor estimate: low (< 2 weeks)

Gigabit Ethernet



Proposed Improvements: Generator

- The purchase of a generator will allow us to power the ROV on ships that do not have compatible power sources with the ROV. This would be necessary to support the Cape Verde proposal (Robison, Hoving).
- Cost: ~\$10,000
- Labor estimate: low

Proposed Improvements: Workshop Van

- The proposed 10 ft van is already purchased. We would like to outfit it as a workspace to service the vehicle while at sea.
- Cost: ~\$15,000
- Labor Estimate: high (ME Tech- 240 hrs)

Proposed Improvements: Portable USBL system

- We propose the purchase of a portable USBL system that could be mounted on a ship of opportunity and used to track the ROV during dives. This will improve the system's ease of use and reduce the risk of loss.
- Cost: ~\$40,000
- Labor Estimate: low

Proposed Improvements:

General maintenance

- Vehicle maintenance and minor improvements
- Cost: ~\$20,000 (annual maintenance budget)
- Labor estimate: medium

Summary Table

Upgrade	Cost	Labor
Gigabit Ethernet	\$15,000	Low
Generator	\$10,000	Low
Workshop Van	\$15,000	High
USBL tracking	\$40,000	Low
Maintenance	\$20,000	Medium

Questions?

