

**Expeditionary Mission Success demands
water, power, mobility, endurance ...**

... and no logistical tail!



**Water Power Mobility Endurance
Free to achieve mission success**



- ✓ Backpack water purification.
- ✓ Racked or Cased power and water.
 - ✓ Vehicle-mounted (HMERV) combined or specialized systems.
- ✓ Totally scalable to suit mission needs, including daisy-chaining up to divisional needs.
- ✓ Comprehensive disaster relief capabilities.

*Free at last,
and Green*

- ▶ Vehicle-mounted and stand-alone or man-pack systems
- ▶ Water Purification
- ▶ Desalination
- ▶ New-Gen. Solar Electric Power Generation
- ▶ Totally air-portable
- ▶ Long-duration field sustainable
- ▶ One-man operation. All Systems Scalable
- ▶ Light Weight.

THE NEW RULES OF WAR:

*Fight Symmetrically, Stay Engaged, and
Prioritize Timely Mission Success*

— *Defense & Foreign Affairs
Strategic Policy 4-2011*

Conventional military forces must change their focus on asymmetric warfare because existing doctrine has failed them, according to a new study on future conflict, and it is now necessary to look at a new form of *symmetric* warfare, which would largely be fought on geographic and climate terms not of their choosing.

The 2011 study by the survivability and mission success team at the International Strategic Studies Association (ISSA) advocated new approaches to fielding and sustaining expeditionary forces, noting that these approaches would also be beneficial to dealing with rear-area “denial-of-service” warfare, in which it could be expected that, in major confrontations, Western “homeland” populations would be subjected to major disruptions to electricity, food, and water supplies which could be more severe than the Japanese *tsunami* of 2011.

ENDING THE TYRANNY OF CONVOYS

Convoys cost lives.

Even in 2001, the US Defense Science Board estimated that **the cost of diesel fuel in the field was around \$400 per gallon**, taking into account the cost of long logistical lines and convoy protection. That was before the Afghan operations, in which diesel and water convoys caused costs to escalate even more dramatically.



Convoys divert resources and priorities away from mission success. For the cost of just a handful of drums of diesel, then, a forward operating force can deploy an *Argonaut* High Mobility Expeditionary Resource Vehicle (HMERV) which can provide potable water from local ground-water sources, without using any diesel resources. It can also generate electrical power to meet the needs of the forward operating base or team. The need for expensive convoys, draining manpower and diverting operational capabilities, is eliminated. Moreover, with the *Argonaut's* go-anywhere mobility, forward troops are not constrained by heavy, road-only vehicles.

VERY, VERY LOW LIFE-CYCLE AND MAINTENANCE COSTS

The *Argonaut* HMERV and its companion stand-alone or manpack systems are designed to work in the field, essentially without spares or filters or serious servicing for up to a decade. No filters to change. No special skills required. The system eliminates the need for heavy, towed diesel generators. The predictable paths of constant convoys become a thing of the past. The *Argonaut* systems enable force commanders to put all their efforts and manpower into mission accomplishment, not mission support.

The independent, durable qualities of the *Argonaut* systems are ideal for disaster relief operations, too, and offer the opportunity to leave behind water purification and power units — and desalination units, if needed — in civil communities.



*Excellence in the Execution
of Expeditionary Operations*



ARGONAUT ON WHEELS, ON BACKS, ON PALLETS

Lightweight, HMERV systems aboard the 4x4 vehicle:

- ▶ **Argonaut HMERV:** Multi-mission (water purification, salt water desalination, electric power generation).
- ▶ **Sea Argonaut:** Vehicle system totally dedicated to desalination.
- ▶ **Land Argonaut:** Vehicle system totally dedicated to water purification.
- ▶ **Power Argonaut:** Vehicle system totally dedicated to electricity generation.
- ▶ **Combinations** Can be created of any of the above, scaled to needs.

Payload and Man-Pack systems:

- ▶ All of the vehicle-based systems can be provided in transportable racks or pallets, or provided in man-pack systems.



*Nothing reduces the financial, casualty, and political costs
of war as much as rapid mission success.*

— The ISSA Report: May 2011



HIGH-MOBILITY EXPEDITIONARY RESOURCE VEHICLES/SYSTEMS

BASIC VEHICLE-BASED (HMERV) SYSTEM SPECIFICATIONS

A wide range of variants is available, on or off vehicle, tailored and scalable to mission requirements.

Mission: Mission effectiveness for expeditionary forces on sustained, rugged terrain ops with minimal logistical tail, minimum weight, maximum nimbleness, and low budget and manpower costs.

The Argonaut HMERV gives military and disaster relief commanders the ability to project forces into remote operations in rugged surroundings for long periods, with high mobility, and with dramatically-reduced logistical requirements for diesel and water. As a command resource vehicle, it provides fully safe water and electrical power output from a single system, with surplus capacity to support allied or civil populations. Argonaut gives units from platoon level and upward the capability for sustained, independent operations in difficult terrain. Minimal maintenance; No spare parts/filter change-out needs; Very low unit costs and operating costs. Argonaut removes the need for heavy trailered or truck-mounted power generation and water purification units, eliminating the need for water logistical tail, and minimizing the need for diesel logistics. Reduces overall unit heat signature. One-man operation.

ARGONAUT HMERV VEHICLE SPECIFICATION: Based on the Proven John Deere M-Gator A2, currently in military service

1. Light Weight: Total weight with all systems aboard 2,500 lb. (1,133.98 kg).
2. Low Profile: Length 113 inches (2.87 m); Width 63 inches (1.60 m); Height 76 inches (1.93 m).
3. Fully Air-Portable: CH-46/7 (sling or internal), V-22, C-27, C-130, and larger.
4. Low Fuel Consumption Engine: 25 horsepower three-cylinder, liquid-cooled Yanmar diesel (JP8 compatible). Vehicle Speed: high forward 32 mph (51.5 kph); low forward 29 mph (47 kph); reverse 15 mph (24 kph). Range: 100-125 miles (160-201 km). Opt. ext. range to 500 miles (804 km).
5. 2- speed Hi-Low Range Transmission.
6. On-demand 4-wheel drive, all-terrain capable, with 11 inch (0.28 m) ground clearance. Dual-piston hydraulic disc brakes.
7. Low overall heat signature, and reduces need for multiple systems (genset, water purifier, water desalinator, etc.).
8. System can evolve to hybrid or electrical vehicle power as cost-effective technologies emerge.
9. One-man operation. All sub-systems one-man or two-man liftable.
10. Can be towed at 55mph in convoy situations as necessary.

WATER PRODUCTION

1. Purification of all water sources utilizing a proprietary ultra-filtration membrane to WHO Gold Seal Standards Certified by the Water Quality Association to USEPA guide standards for microbiological water purifiers as interpreted by WQA and NSF/ANSI 42 and 53, etc.
2. Average fresh water yields under extreme conditions using solar power 2,500 gal/day (9,450 liters). Desalination from salt water by solar 400 gal/day (1,514 liters). If diesel generator used: 10,000 gal/day (37,800 liters) from fresh sources; 800 gal/day (3,028 liters) desalination from salt water. Lifecycle water costs estimated at US2¢ (\$0.02) per gallon or less.
3. Source water lift capabilities to 175 feet (54 meters) with optional 300 foot (91 meters) lift capabilities.
4. Totally automatic operations including backwashing and cleaning cycles.
5. Low maintenance: 10-year life cycle, no disposable filters or cartridges. Emergency spares and specialty tools provided.
6. Optional post-treatment systems for UV and chlorination available.
7. Designed for daisy-chain deployment for higher yield applications in multiples of yield rates.
8. May be configured and deployed free of the HMERV as a standalone unit or as a three-piece modular system.
9. A compact stand-alone water production system (ie: off-vehicle) 5x2x2 ft. footprint (1.52x0.61x0.61 meters) total weight 330 lb. (149.685 kg) is available, or, in a three-piece modular configuration: 3x110 pounds (49.89 kg).
10. Power-free water purification of pressurized water (from flowing streams or urban systems).

ELECTRICAL PRODUCTION

1. Roll-up (blanket) solar array output 760 to 3,040 watts.
2. Lithium Ion Storage Battery capacity 320 amps with options to 960 amps.
3. Auxiliary AC/DC charging terminals for 12, 24, 120/240 volt systems with 4.1 kW inverter/charger system.
4. Fully selectable output destination (water production/battery bank/both).
5. Designed for daisy-chain deployment for higher yield applications in multiples of basic solar output and storage capacity.

Full Support, Spares, and Training Packages

Full spares and specialty tools provided for each vehicle. Training packages provided. Full spares and support back-up from Argonaut Systems, the vehicle manufacturer, and specialty systems providers through an Argonaut hotline.

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ARGONAUT SYSTEMS

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