

# WAM-V<sup>®</sup> B.O.S.S.



The WAM-V 16' B.O.S.S. (Benthic Operations Survey System) are unmanned, robotic surface vessels specifically equipped for bathymetric data collection

## SPECS

Length	16'
Beam	8'
Max Draft	20"
Max Speed	11 kn
Max Range	100 nm
Max Payload	175 lbs
Vessel Weight	595 lbs
Propulsion	twin 2 kW electric outboards
Batteries	four 105 Ah Lithium Ion

## CHARACTERISTICS

The WAM-V B.O.S.S. is the perfect drone for routine mapping. Its shallow draft and supple hull design are ideal for conducting hydrographic surveys in rapidly shoaling environments. It is equally well suited for deep water surveys thanks to its seakeeping ability.

The automation of routine mapping mitigates worker fatigue and frees crew members to focus on overall data quality. In foul weather or in hazardous environments, the WAM-V B.O.S.S. reduces potential harm to survey crews.

The highly engineered articulation and suspension system of WAM-V drones dampen rotational and translational forces thereby reducing measurement noise and data artifacts produced by unwanted vessel movements during survey transects.

WAM-V B.O.S.S. can be hoisted from the deck of a traditional survey boat with a dingy davit. It can be used as a peripheral instrument to conduct simultaneous nearshore transects. It can be assembled and shore-launched by a two person team for independent operations in complex littoral, estuarine, or riverine environments.

[www.WAM-V.com](http://www.WAM-V.com)

## STANDARD EQUIPMENT

- GPS Path Navigation System
- Low-Drag, Retractable Sensor Mount
- Stand-alone Data Acquisition System
- 180° FOV Camera
- Differential GPS Antennae Mounts
- Rugged GPS/INS
- Encrypted Wireless Network
- AIS Transceiver
- 350 W Charging System
- Navigation Lights

## OPTIONAL EQUIPMENT

- 1200 W Rapid Charging System
- Multi-beam Sonar
- Side Scan Sonar
- Custom Sidescan and Multibeam Mounts
- Self-healing Ad-hoc Communications Network
- Satellite Communications
- Intermodal Freight (Sea-Air-Land) Shipping Container
- Custom 19' Twin-Hull Conforming, Single Axle Trailer



# NAVIGATION and CONTROL SYSTEM



## Mobile Operator Control Unit

Mobile, handheld, steering and velocity control unit with integrated, independent real-time video navigation and camera displays for land or sea-based peripheral piloting within 2 nm of the vessel.



## ROCS™ Remotely Operated Command Station

Portable, self-contained, remotely operated command station. Allows a second operator to passively monitor sensor feeds or take control of the vessel in a tele-operated mode from over the horizon. An integrated MARCODE™ network and software ecosystem enables redundant vessel control and duplication of in-situ sensor measurements, video streams, and ancillary data to off-site command via secure internet cellular connections.



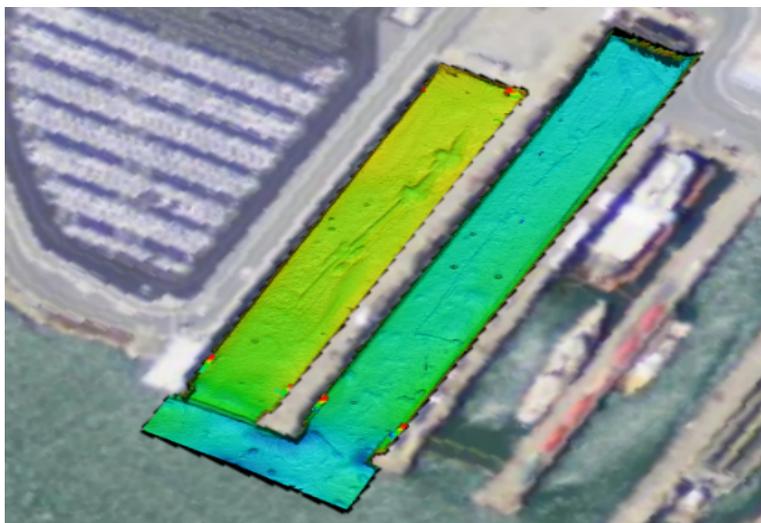
## ROBO-HELM™ Integrated Onboard Control System

Onboard, waterproof, self-contained, computer navigation and control system. Contains GPS, IMU, digital navigation, propulsion, steering, range, power usage, PTZ navigational video camera controllers, redundant cellular and RF network switches with additional multiplex sensor data port



## MARCODE™ Control and Communication Software

PC, Tablet and Mobile front-end Graphical User Interface (GUI) with multimodal network software and firmware governing ROBO-HELM parameter inputs for communication, navigation, velocity, steering, and secure auxiliary sensor data transmission



Sample bathymetric data collected by a 16' BOSS WAM-V showing a color composite rendering of an abandoned graving dock in the San Francisco Bay

## MARINE ADVANCED RESEARCH, Inc.

Founded by a small group of Silicon Valley innovators, Marine Advanced Research introduced the WAM-V technology (Wave Adaptive Modular Vessels) with the 100' *Proteus* prototype. This technology has proven uniquely suited to the needs of the emerging unmanned surface vessel (USV) market. Currently, WAM-Vs are operating in 5 different countries.

### MARINE ADVANCED RESEARCH, INC.

University of California Berkeley Global Campus  
1301 South 46<sup>th</sup> St. Bldg. 300A □ Richmond, CA 94804  
Phone: +1-510-232-1685 □ Fax: +1-510-215-1583  
[www.WAM-V.com](http://www.WAM-V.com)

© 2010-2015 Marine Advanced Research, Inc.

## WAM-V® TECHNOLOGY

### WAM-V Characteristics and Advantages

**Wave Adaptive:** the unique elements of the WAM-V design allow the hulls to move with the waves while the center platform remains stable. The inflatable hulls act like the tires of a vehicle to absorb vibrations caused by high frequency waves. The articulation and suspension systems dissipate the medium to low frequency waves.

**Modularity:** payloads and instrument packages can be quickly switched, allowing mission-specific customization in minutes. Modular engine pods with different propulsion systems can be swapped easily depending on mission or maintenance requirements.

**Scalability:** WAM-Vs can be built in different lengths to match specific applications and customer's needs.

**Stability & Maneuverability:** the 2:1 length to beam ratio along with articulation and suspensions systems make the WAM-V an exceptionally stable and seaworthy platform. Widely spaced engine pods enable a high degree of maneuverability, allowing the vessel to turn 360° within its own length.

**Helicopter-like Functionality:** a WAM-V can pick up and deliver payloads from its center structure in open ocean or in very shallow water. No need for an over-the-side crane or A-frame.

**Reduced Footprint:** WAM-Vs can be disassembled into components and packed for shipment. Alternatively, they can be designed to hydraulically, electrically or manually fold and reduce their footprint by up to 75%. This significantly lowers deployment costs.