

Oceanographic Systems Laboratory, WHOI: REMUS 6000 Specifications

Vehicle Specifications

Vehicle Diameter:	71 cm/28 in
Vehicle Length:	3.84 m/12.6 ft
Weight in Air:	862 kg/1900 lbs
Max Operating Depth:	6000 meters/19,685 ft/3.7 miles
Energy:	11 kWh rechargeable Li-ion battery pack
Endurance:	Mission duration of up to 22 hours
Propulsion:	Direct drive DC brushless motor to an open 2-bladed propeller
Velocity Range:	Up to 2.6 m/s (5 knots)
Control:	2 coupled yaw and pitch fins; altitude, depth, yo-yo, and track-line
Tracking:	Emergency transponder, mission abort, ascent weight drop, Iridium, GPS
Communications:	Acoustic modem, Iridium, 802.11B Wi-Fi

Navigation

Inertial Navigation Unit (INU)

Consists of accelerometers and gyros which measure the vehicle's movement in three directions (surge, sway, heave), and three rotations (roll, pitch, yaw), just like an airplane or a rocket to determine the vehicle's velocity and current mission travel distance.

Integrates data from other instruments to calculate a "best estimate" of the vehicle's actual location.

Acoustic Doppler Current Profiler (ADCP)

Uses pulses of sound bounced off of the seafloor to determine the vehicle's altitude and ground speed.

Pencil-Beam Sonar Collision Avoidance System

Uses pulses of sound sent in the direction the vehicle is headed that bounce off of obstacles in its way, determining the need for evasive action to maneuver around an obstacle.

Communications

Upper and Lower Long Baseline Transducers

Communicates through "pings" with pre-laid Deep Ocean Transponders (DOTs) to determine the vehicle's location relative to its pre-programmed route.

Enables shipboard ops to send and receive data from the vehicle via multiple pulses similar to morse code.

Allows for clear communications in any vehicle position via either the upper or lower instrument.

Acoustic Modem Transducer

Enables shipboard ops to send data to the vehicle via multiple pulses similar to morse code.

GPS/Iridium/Wi-Fi Antenna

Consists of a 3-way antenna that allows the vehicle, when at the surface, to determine its position using GPS.

Connects the vehicle's system to the shipboard computer via a WiFi connection, or Iridium satellite phone connection.

Enables the vehicle to "phone home" with its location, if it becomes lost.

Survey Instruments

Dual-frequency Side-Scan Sonar

Consists of two arrays of transducers (underwater speaker/microphones) that look out and down on either side of the AUV.

Illuminates the seafloor via sound waves, using "pings" to assemble a 2D image of the seafloor and the objects resting on it.

Custom Digital Camera w/Strobe Light

Snaps digital photographs when the vehicle is within 10 meters of the seafloor, synced with strobe light just like a flash bulb on a typical consumer camera.

Tags photos with position and time and stores them in an onboard hard drive, download-able at the surface.

Multibeam Profiling Sonar Consists of multiple sonar beams which "ping" the seafloor at different angles, creating a 3D image of its contours and shape.

Sub-Bottom Profiling Sonar

Uses a powerful sound beam to look at what's buried under the sediment on the seafloor.

Conductivity, Temperature, and Depth Sensor (CTD)

Measures conductivity (the saltiness of the water), water temperature, and vehicle depth.

Structure

Vehicle Frame and Foam Hull

The titanium internal spine (called a strongback) provides structural support and a frame to which all the instruments, motors and electronics are secured in water-tight, pressure-resistant metal cans.

The outside hull consists of large blocks of syntactic foam (in yellow) that provide flotation, are impenetrable by water and do not crush at depth under extreme pressures.

Lifting Bail

Provides a safe structural lifting point for pulling the vehicle out of the water.

Propulsion/Propeller Shaft

Provides precision thrust and direction capability to steer the vehicle.

Electronics and Battery Compartment

Holds the vehicle computer and its lithium-ion batteries that provide a rechargeable, lightweight and efficient power source.

Recovery Strobe Light

Supplies a bright, blinking white light for nighttime vehicle recovery operations.

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