



ISE International Submarine Engineering

Over 3 decades of Engineering Excellence

ARCS

Length:	21 feet (6.4m)
Diameter:	27 inches (68.6cm)
Displacement:	3000 lbs. (1360.8 kg)
Speed:	Normal: 4 knots Top: 5.5 knots
Range:	22.5 or 45 miles (36 or 72 km)
Depth:	1000 feet (304.8m)
Propulsion:	2.5 HP brushless DC motor
Power:	One or two 10 kWh NiCd batteries
Supervisory Control:	Triply diverse full duplex acoustic telemetry link (FSK)
Onboard Control:	Motorola 32-bit processor with real Time proprietary control system
Sensors:	Honeywell MAPS 726 inertial Navigation unit EDO 3050 Doppler sonar Strain gauge depth transducer
Navigational Accuracy:	<1% of distance traveled
Obstacle Avoidance:	Sonatech 200/230 kHz obstacle avoidance sonar



The ARCS vehicle was developed by ISE Research Ltd. as a platform for autonomous vehicle research. Sponsors of this program include the Canadian Hydrographic Service, the Department of National Defence, and ISE Research. Development and testing of the ARCS vehicle was undertaken between 1983 and 1986.

The vehicle has autonomous control, navigation, and guidance capability. With a 20 kWh nickel cadmium battery, it has an endurance of 10 hours and a payload capacity of 300 lbs. If a smaller 10 kWh battery is used, the payload capacity increases to 1400 lbs.

Since 1987, the vehicle has been used for the development and demonstration of autonomous underwater vehicle technologies. This has included development of mission controllers, navigation systems, variable ballast and trimming concepts and advanced power sources. Users of the ARCS vehicle system include the Department of National Defence, John Hopkins Applied Physics Laboratory, Rockwell International and Fuel Cell Technologies. Over 800 dives have been conducted. Recently, a 60 kWh Aluminum Oxygen fuel cell was successfully tested on a 35 hour continuous run.

The ARCS is currently being used for prototype development of AUV technologies, including continuing development and test of aluminum oxygen fuel cells.

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