



<b>Infrastructure name</b>	<b>AUV Autosub6000</b>
<b>Code</b>	Autosub6000
<b>Owner/Institution</b>	National Oceanography Centre; UK
<b>Manager</b>	Stephen McPhail (sdm@noc.soton.ac.uk)
<b>Equipment type</b>	6000m AUV
<b>System description</b>	Autosub6000 and LARS
<b>WEB LINK</b>	<a href="http://www.noc.soton.ac.uk/nmf/usl_index.php?page=uplat">http://www.noc.soton.ac.uk/nmf/usl_index.php?page=uplat</a>
<b>WEB LINK TECH SPECS</b>	<a href="ftp://ftp.noc.soton.ac.uk/pub/autosub/Autosub6000/Spec%20and%20LARS.pdf">ftp://ftp.noc.soton.ac.uk/pub/autosub/Autosub6000/Spec%20and%20LARS.pdf</a>
<b>Vessels normally used</b>	RSS Discovery
<b>Ship requirements</b>	
Launching method	The Autosub6000 Autonomous Underwater Vehicle is deployed and recovered with a gantry system bolted or welded to the ship's deck.
<b>Technical requirements</b>	
Weight	1800 kg (Dry), 2900 kg (Flooded). 5600 kg (Gantry/LARS)
Buoyancy (water)	
Dimensions	5.5 m long, 0.9 m diameter
<b>Battery</b>	
Technology	Lithium Polymer rechargeable batteries (4 batteries)
Charging time	6 hours from fully exhausted lithium polymer battery pack
Battery autonomy (e.g. X hrs @ X kn	27 hours, at 1.6 ms-1, is 155km. Space for up to 12 batteries with proportionate (x 3) increase in range and endurance
Battery capacity	1000 km at 1 m/s (8.6 days). 400 km at 1.6 m/s. (2.9 days)
<b>Dives</b>	
Mission depth	6000m
Duration	36 hours
Speed	1.0 - 1.8 m/s (Descent = -1.0m/s; Ascent = 1.5m/s)
Max. range	155km (x 3 if more batteries used) = 465km
Details of Autonomy/settings in emer	<b>Obstacle and Collision avoidance:</b> Forward look obstacle avoidance based on Tritech Seaking scanning sonar. 10 m safe flying altitude in very rough terrain, 3 m in less rugged terrain. Collision Avoidance triggered when obstacle ahead cannot be cleared safely AUV turns and tries again at a shallower depth.
<b>Power</b>	Up to 250 Watts at 48 volt - other voltages can be derived
Frequency	
Voltage	
KVA	
Max Amps	
Other power requirements - (NOC hy 3 phase, 440V, up to 100 Amp, 63 Amp minimum	Preference is to use the ships hydraulic system but can supply an independent power pack where not possible.
<b>Hydraulic - for LARS</b>	

Pressure	207 bar (180 bar minimum)
Flow rate	140 Litre/minute (in calm conditions, lower rate can be used)
<b>Compressed air requirements</b>	
Cooling water	
<b>Subsea positioning requirements (AUV Navigation)</b>	
	0.1% of distance travelled when within 200 of the seabed, using the IXSEA PHINS and RDI Teledyne Workhorse Navigator ADCP. Range only acoustic positioning to within 10 m when at 5000 m operating depth at the start and end of the mission.
<b>Vessel GPS Feed or other requirements</b> GPS on surface	
<b>Communication requirements</b>	
Acoustic	LinkQuest Tracklink 1000 for USBL and two way short messages of vehicle parameters up to 7 km range. Supported by tow fish. Sonardyne Compatt 5 transponder as a positioning backup (for ships equipped with compatible equipment).
Satellite	Relocation (surface): 2 independent ARGOS satellite tracking beacons
WiFi	WiFi (IEEE 802.11g) with range of 1 km. All data can be downloaded via this link, and new missions can be uploaded
Visual	2 independent Novatech ST-400 A Flashing lights
Deck Cable	
<b>Vessel Networking requirements</b>	100 M bit s-1 TP Ethernet. 200 G byte data storage. IEEE 802.11g WiFi for data download
<b>No. of System configurations possible</b>	
Configuration 1	
<b>Deck Layout Drawing</b>	
Configuration 1	<a href="ftp://ftp.noc.soton.ac.uk/pub/autosub/Autosub6000/Spec%20and%20LARS.pdf">ftp://ftp.noc.soton.ac.uk/pub/autosub/Autosub6000/Spec%20and%20LARS.pdf</a>
<b>System weight/COG in each configuration</b>	
Configuration 1	
<b>Number of containers/Items, Footprint Area required</b>	
Configuration 1	1 of 20 foot ISO shipping container for the AUV. Also used as workshop.
	1 of 20 foot soft-top shipping container for the Launch and Recovery system.
	The NOCS hydraulic power pack system is packaged within a ten foot ISO shipping container
	Reference Autosub and gantry dimensions diagram at: <a href="ftp://ftp.noc.soton.ac.uk/pub/autosub/Autosub6000/Spec%20and%20LARS.pdf">ftp://ftp.noc.soton.ac.uk/pub/autosub/Autosub6000/Spec%20and%20LARS.pdf</a>
<b>Deck securing arrangements</b>	
Configuration 1	
<b>Deck strength/Deck loading</b>	
Configuration 1	Max compressive deck load: 3848kg - Each side, outer-most fixing, Flooded Autosub at full stretch beyond ship
	Maximum tensile deck load: 2923kg* - Each side, inner-most fixing, Flooded Autosub at full stretch beyond ship. *If the maximum permitted tensile deck loading is less than this spreader beams can be used to distribute the load.

<b>Transportation requirements (total weight and number of loads)</b>	
Configuration 1	
Configuration 2	
Configuration 3	
Configuration 4	
V.A.T. + Customs clearance practice	
<b>Mobilisation Details</b>	
Typical Mobilisation duration	
Typical Mobilisation cost	
Typical Demobilisation duration	
Typical Demobilisation cost	
<b>Insurance arrangements</b>	
Own use	
Barter	
Charter	
Co-operation	
Transportation insurance	
<b>Technicians</b>	
Number and type of technicians required to operate system in various scenarios	
<b>System payloads</b>	
Total maximum payload (kg)	
Existing specific payloads	EM2000 Multibeam Sonar. 350 m swath at 100 m altitude. Seabird 911 dual CTD system with DO and LSS. Workhorse 300 kHz ADCP Navigator with Current Profiling. Tri axis flux gate magnetometer. Survey Photographic System. 1 km <sup>2</sup> per day, at 10 mm resolution (mono).
Additional payloads	Large (0.5 m <sup>3</sup> ) volumes free in the nose area for payloads