

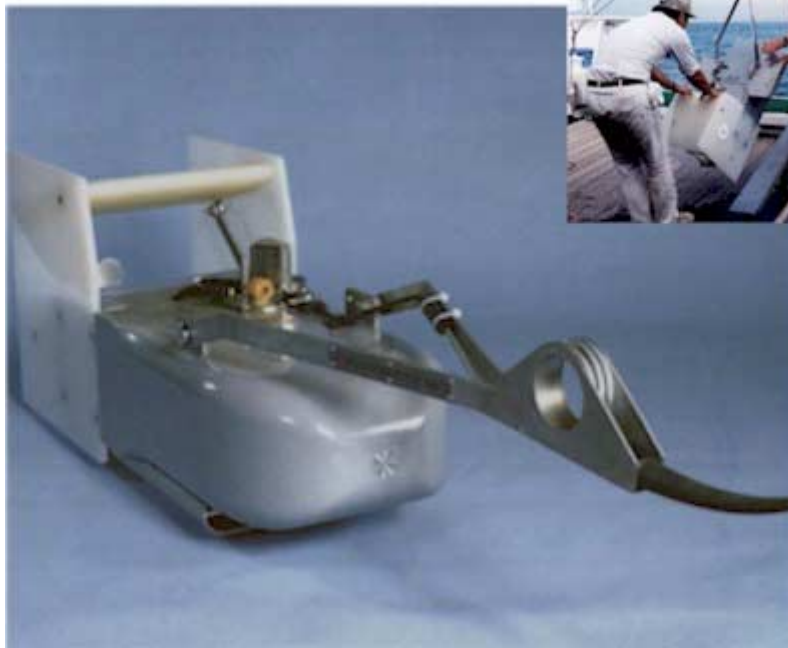
# AQUA *shuttle* III

Towed, undulating data  
acquisition vehicle



## APPLICATIONS

- Oceanographic data gathering from ships of opportunity
- Ecosystem health monitoring
- Real-time two dimensional data gathering in support of oceanographic modelling
- Pollution monitoring and dye tracing studies
- Sea truthing for satellite remote sensing
- Continuous plankton monitoring and sampling
- Estuary, coastal zone and open ocean surveys
- Local area site assessment



## FEATURES

- Highly stable, light weight and robust
- Versatile payload configuration
- Generates its own power for vehicle control
- Wide tow speed range (8 to 25 knots)
- Pre-programmable or real time control
- Fast data acquisition (logged or real-time)
- Undulating depth range from 0 to 135m
- Undulation wavelength 800m to 4km

## AQUA<sup>shuttle</sup> III

The AQUA<sup>shuttle</sup> III is a stable, highly robust, versatile undulating towed vehicle for deploying a wide range of oceanographic monitoring equipment. Designed and developed by Chelsea Technologies Group and the Plymouth Marine Laboratory, UK, it has a proven record of reliability over many thousands of miles of operation.

The vehicle has a strong glass reinforced plastic body with a robust integral stainless steel framework which can accommodate a wide range of sensor payloads. Its 'flight' profile is maintained by a servo-controlled elevator, the servo being powered by the vehicle's own impeller driven alternator.

Real-time control and data display enables the operator to observe the two-dimensional oceanographic conditions and adjust the flight parameters accordingly. Capable of tow speeds from 8 to 25 knots, AQUA<sup>shuttle</sup> will undulate from the surface to 135 metres. The stand-alone capability, ease of handling, high data rate and versatility of sensor and sampling packages make this a cost effective and productive platform for large scale data collection. With the growing need to monitor diverse marine ecosystems on a regular basis, AQUA<sup>shuttle</sup> has a proven record of extensive use on research vessels and ships of opportunity.

## SPECIFICATION

The standard AQUA<sup>shuttle</sup> package comprises the underwater vehicle, depth sensor, alternator and servo control system.

### AQUA<sup>shuttle</sup> Body

<b>Length:</b>	1.06m	<b>Weight</b> (incl. Servo Control, excl. Logger Port		
<b>Height:</b>	0.50m	& Sensors):	In Air	66kg
<b>Width</b> (including wings):	0.72m		In Water	45kg

### Operating Profile

<b>Control:</b>	Self-contained processor control of elevator servo from pre-programmed profile or real-time communications
<b>Depth Range:</b>	0 to 70m unfaired (135m faired) typically
<b>Towing Speed:</b>	8 to 25 knots
<b>Drive / Climb Speed:</b>	1 m/s maximum

### Engineering Details

<b>Flight Programme:</b>	Input from computer via RS422 link
<b>Elevator servo:</b>	Digital control with depth sensor
<b>Power:</b>	Impeller driven alternator powering digital servo above 5 knots
<b>Material:</b>	Strengthened glass fibre reinforced plastic body; 316 stainless steel frame and towing yoke

### Support Systems

<b>Winch:</b>	Dedicated winch with slip ring assembly only required when used in real time mode with power/data communication to surface deck unit. When towing on a bare cable, a standard ships capstan may be used.
<b>Cable:</b>	Rochester 7-H-314A or equivalent for real-time deployments
<b>Fairing:</b>	Fathom Flexnose(R) fairing is used for increased depth and undulation range performance

### Typical Instrumentation Payload

<b>Combination of:</b> CTD, Fluorimeter, Transmissometer, Nephelometer, Bioluminescence, Irradiance meter, Optical plankton recorder, Plankton Sampler, Nitrate/Nitrite sensor, and SeaWifs bands sensors
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All instruments & support systems can be supplied by Chelsea Technologies Group.



**Chelsea  
Technologies  
Group**

55 Central Avenue  
West Molesey  
Surrey KT8 2QZ  
United Kingdom  
Tel: +44 (0)20 8481 9000  
Fax: +44 (0)20 8941 9319  
sales@chelsea.co.uk  
www.chelsea.co.uk