Autonomous deep water survey vessel

It was announced from Portsmouth on 16 July that ASV Global (ASV), in partnership with Sonardyne International Ltd., the National Oceanography Centre (NOC) and SeeByte, have successfully delivered a long-endurance, multi-vehicle, autonomous survey solution.

A recent two-week trial in Scotland’s Loch Ness was the culmination of the three-year Autonomous Surface and Sub-surface Survey System collaborative project, part-funded by Innovate UK\(^1\) and Dstl\(^2\).

The aim of the project was to deliver an integrated system to perform low cost, full water column marine surveys using multiple autonomous systems.

During trials in and on the loch, Sonardyne’s USBL acoustic positioning and AvTrak telemetry systems enabled ASV’s C-Worker 5 Autonomous Surface Vehicle (ASV) to locate, track, command and control the NOC’s Autosub Long Range (ALR) Autonomous Underwater Vehicle (AUV). Position and mission status updates were transmitted to shore via RF communications.

The need to collect more data from the marine environment means that marine autonomous systems need to be at sea for longer. Pairing an AUV or unmanned underwater vehicle with an ASV means that positioning accuracy – crucial for high-quality survey data – can be optimised on missions lasting weeks, if not months, without the need for manned surface vessel support.

This game changing technology can open up dramatic cost savings in a wide range of maritime applications from pipeline survey to scientific coral exploration and deep water seabed mining.

In the words of James Cowles, Commercial Technical Sales Manager: ‘This project has enabled ASV to extend its survey capability; pairing an AUV with our already proven survey platform, the C-Worker 5, has opened up new opportunities for our technology. We have been able to leverage the experience gained from this project into commercial applications, such as our recent delivery of eight ASVs to Ocean Infinity for AUV tracking.’

Geraint West, Global Business Manager, Oceanographic, Sonardyne added: ‘We’ve shown that our technology can enable an AUV to operate autonomously with an ASV and offload its Solstice side-scan survey data using our BlueComm high-speed optical modem. Proving acoustic enabled multi-vehicle tracking, command and control, with high-speed through-water data transfer also lays
the groundwork for long-range, over-the-horizon autonomous underwater vehicle survey operations.’

Matthew Kingsland Senior Robotics Systems Engineer, NOC, said: ‘We are now able to send down new missions via acoustic communications to avoid the ALR having to surface from six kilometres deep. We are not only tracking, we are getting quality data back from the system via acoustics, so we can make informed decisions.’

Pedro Patron, Engineering Manager at SeeByte concluded by saying: ‘Under this project, we have demonstrated a novel autonomous behaviour running under the Neptune Autonomy engine able to optimise search, localisation and tracking of multiple vehicles based on understanding of the overall mission tasks and the prediction of other vehicle positions. This behaviour enables safe unattended comms relay tasking and efficient data transfers for long-range over-the-horizon maritime operations.’

1 Innovate UK, part of UK Research and Innovation, a non-departmental public body funded by a grant-in-aid from the UK government. See also: https://www.ukri.org/
2 Dstl, the (UKs) Defence Science & Technology Laboratory. See also: https://www.gov.uk/government/organisations/defence-science-and-technology-laboratory