

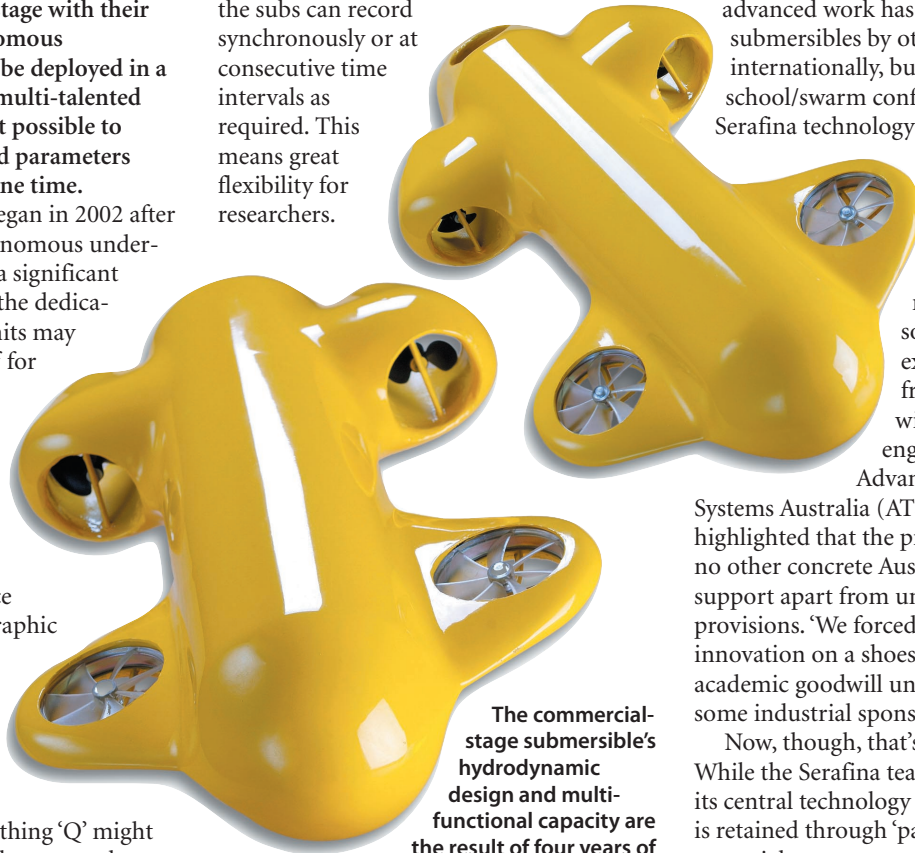
Mini yellow subs will accelerate underwater research worldwide

A team from the Australian National University in Canberra is leading underwater monitoring technology, having reached the commercial stage with their cost-beating, mini autonomous submarines. Designed to be deployed in a fleet, the programmable multi-talented submersibles now make it possible to record a range of data and parameters from multiple points at one time.

The Serafina Project began in 2002 after insight that multiple autonomous underwater devices could have a significant impact in research. Now, the dedication to perfecting such units may finally be about to pay off for School of Information Sciences and Engineering project leader Dr Uwe Zimmer and his team. Advance international customers are lining up to employ the Serafina submersibles in geoscience exploration and oceanographic research, and their obvious application to environmental monitoring and wider exploratory work is drawing strong interest.

Looking just like something 'Q' might unveil to 007 at MI5 Headquarters, the submersibles are about 50 cm long and

of specific sensors such as to record salinity, pH or light levels. Small cameras may even be fitted. Once in position the subs can record synchronously or at consecutive time intervals as required. This means great flexibility for researchers.



The commercial-stage submersible's hydrodynamic design and multi-functional capacity are the result of four years of development. Serafina Project, ANU

'Much advanced work has been done on submersibles by other organisations internationally, but the scalable large school/swarm configuration of the Serafina technology makes it unique.'

come loaded with high technology. They operate to directions given by pre-loaded computer programmes and communicate from the depths to a command centre by long-range radio.

Direction, speed, depth, distance and particular measurement recording functions are all decided beforehand, and an electronic compass on board, as well as linear acceleration, pressure and sonar sensors, respond to the commands. The submersibles can also be fitted with a range

'The advance is that this tool can measure in many places simultaneously. You can record distributions over time and space of any parameter that can be measured by small sensors. You can measure volumes, you can measure reliable gradients of salinity and temperature, as well as temporal developments,' Dr Zimmer explained. 'Every project or customer has its favourite value to be measured.'

'There have been no synchronous wide-range underwater sensors available before

now. Currently you need to move your sensor to a particular one-off spot, and when deploying only one vehicle, it takes a long time to make all the required recordings. That still doesn't deliver the ideal picture as the one-off measurements are not necessarily comparable given the time difference.'

When asked about the uniqueness of his team's engineering, Dr Zimmer said, 'Much advanced work has been done on submersibles by other organisations internationally, but the scalable large school/swarm configuration of the Serafina technology makes it unique.'

As far as we know, there is no direct competitor worldwide.'

Although now receiving some development expertise support from a partnership with electronic engineering company Advance Technology

Systems Australia (ATSA), Dr Zimmer highlighted that the project had attracted no other concrete Australian development support apart from underlying academic provisions. 'We forced out the designs and innovation on a shoestring budget and academic goodwill until we finally got some industrial sponsorship.'

Now, though, that's all changed. While the Serafina team is ensuring that its central technology development role is retained through 'partnerships' with potential new commercial and academic contributors, a new company, Project SeaSwarm, has been founded exclusively for the development and marketing of the vehicles.

Pointing to another central reason for the growing interest in his team's yellow subs, Dr Zimmer said, 'Right now all customers on the "pre-order list" are from the industrial side – at about US\$10 000 per submersible, our vehicles are extremely cheap with respect to what customers are used to for open-waters operations.'

● James Porteous

More information:

Serafina Project: <http://serafina.anu.edu.au> (includes video footage of the submersibles in action)

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