



AUTONOMY – PAST, PRESENT, FUTURE



DEFENCE

EWEN LEVICK | SYDNEY

AUTONOMY: self-governing, freedom of action, independence of thought.

These are the definitions returned by a quick Google search. They're small phrases, but they contain enormous challenges. An autonomous platform is not just an unmanned platform flown by a pilot sitting in an office chair. An autonomous platform has no pilot at all. Autonomy means a machine that can make its own decisions; a machine that can answer the questions of how, when, and where to deliver tactical outcomes in any domain. It means learning, adapting, adjusting, responding. These verbs are easy for humans, but coding them into a software program requires industry-leading expertise.

BAE Systems Australia has a three-decade pedigree in autonomous technologies. Perhaps the most famous example this expertise is the Nulka active missile decoy, which is now Australia's largest regular defence export. The decoy is completely autonomous post-launch.

"Nulka is really where it started," Glenn Logan, Director of Technology & Product Development for BAE Systems Australia, said to ADM. "It formed the capability within BAE Systems Australia, and on the basis of that, autonomy became one of our key areas."

In the 1990s, the company was the lead Australian participant in the Raytheon-led collaboration to develop the Evolved Sea Sparrow Missile (ESSM), which protects warships against anti-ship cruise missiles. BAE Systems Australia developed the thrust vector controller, the aerodynamic control fins, the guidance section units and the algorithms that tied them all together.

Elsewhere, BAE Systems Australia has supplied flight control computing to the UK's Mantis program, and the company's Melbourne office was also involved in the UK's Taranis stealth unmanned combat aircraft technology demonstrator.

"We partnered with the UK in the early 2000s to develop a range of autonomy as-

sets through our Melbourne team – which is really the forerunner to Red Ochre Labs," Logan said. "In nine months we developed and delivered the whole autonomy solution - all the control systems, all of the data links, all of the RF comms, all of the ground station – and we all met up at Woomera, exactly 100 years to the day since the Wright brothers flew."

The autonomous technologies BAE System Australia supplied to those programs were recently integrated into two prototype autonomous M113 armoured personnel carriers, which were demonstrated to the Chief of Army in late 2019. More information on this program is available in the breakout box on page XX.

BAE Systems Australia has also leveraged experience built in the UK demonstrator programs to supply flight computers, navigation equipment, flight vehicle management and simulation capability to Boeing's Loyal Wingman since 2016, an autonomous fighter-like aircraft under development with the RAAF.

Now, BAE Systems Australia's Red Ochre Labs will bring all this expertise together under one roof.

"Red Ochre Labs allows us to bring all our people back out of those projects into a central place and re-establish that whole culture that we'd set up around autonomous systems," Logan said. "We have a long history, and now we're really looking to collaboratively work with Australian industry."



BAE SYSTEMS AUSTRALIA

ABOVE LEFT: The M113 unmanned conversion trial was a big win for both BAE Systems Australia and Army.

LEFT: BAE Systems Australia has a long history of unmanned flight platforms with Taranis being tested at Woomera.