

Feature Story

Australian R&D powers the future of AI

- Robots, autonomous systems and artificial intelligence: Boeing Australia is advancing the technologies of tomorrow today – from manufacturing through to flight.

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A rhythmic beeping signals the entrance of ‘Wayne’ into Boeing’s 787 Dreamliner production area in Melbourne. Wayne, the autonomous collaborative robot – known as a cobot – works on the shop floor alongside its human teammates, carrying out tasks that previously caused repetitive strain injuries.

Australia is the first Boeing site to use autonomous mobile collaborative robots and since being introduced two years ago, potential workplace injuries in the 787 area have significantly decreased.

“Getting the 787 wing tools or mandrels ready for manufacturing in the tool preparation area was important but repetitive work,” explains Josip Mihalik, team lead in the Boeing Aerostructures Australia 787 factory. “Now it’s all offloaded to the cobot, so we can focus on more valuable and meaningful tasks.”

Boeing’s mobile autonomous cobot was recently named a finalist in the Safety Solution of the Year category at the upcoming [2022 Endeavour Awards](#).

Mihalik and his colleagues are reaping the benefits of a decade of development work, during which Boeing Australia teammates have been coding the blueprint for safe and trusted AI and autonomous behaviours in uncrewed aircraft and robotics.

The autonomous behaviours built into Boeing’s cobots, designed and engineered in Australia by Boeing Research & Technology aerospace engineers, are pushing the limits of what autonomy can achieve in a complex factory environment such as an aircraft production line.

You can find Wayne self-navigating and moving around the 787 factory, avoiding people and obstacles, and using its handy mechanical arm to carry out sanding and cleaning alongside manufacturing staff. A second cobot is being trialled in the 737 production area for similar purposes before the cobots are rolled out more broadly to other Boeing sites around the world.

Australian-made Boeing autonomous technologies:

- [Boeing Airpower Teaming System](#) – first uncrewed autonomous military aircraft built in Australia in half a century.
- [Insitu Pacific ScanEagle ‘Detect and Avoid’](#) – enhancing safe airspace integration of uncrewed aircraft systems (UAS).

- [Phantom Works Global machine-learning software](#) - Uncrewed technology teaches multiple UAS to detect, decide and act during missions.

Boeing Australia has long been The Boeing Company's testbed of innovation for autonomous technology, thanks to a unique partnership between Boeing Research & Technology – Australia, Phantom Works Global and a suitable and safe testing environment. Australia's wide open spaces with low airspace complexity, Civil Aviation Safety Authority, and a first class military and resource industry with a strong interest in integrating autonomous systems into their portfolios support R&D efforts.

“Continued investment by Boeing in the region, strong government support and safety-focused regulators make Australia the perfect testing environment for new commercial and defence products,” said Michael Edwards, director of Boeing Research & Technology – Asia Pacific. “These cobots highlight the best of Australian engineering, being designed and developed right here in Melbourne in our co-located advanced manufacturing site.”

The critical AI knowledge and coding skills required to develop autonomous behaviours and navigation are key factors in Boeing's success. Developed by talented Australian employees, each platform has custom software that automates different tasks, such as the 'brain' on board the mission system of Boeing's smaller test assets, through to the newest uncrewed aircraft system, the MQ-28A Ghost Bat, and cobots like Wayne.

Phantom Works Global, the defence rapid prototyping arm of Boeing Australia, tested autonomous behaviours in the [early phases](#) of the Airpower Teaming System (now MQ-28A Ghost Bat) and is extending its R&D into multiple domains.

“Our focus is on creating systems that team together between multiple mission systems to work as one across air, land, sea and space,” said Emily Hughes, director of Phantom Works Global. “We are refining our work in autonomy and AI to provide new autonomous teaming solutions to the Australian Defence Force.”

From cobots like Wayne reducing workplace injuries to uncrewed systems protecting Australia's national interest, humans are quickly learning - almost as fast as machines - how important these technologies are for embracing opportunities and confronting future challenges.

Boeing Australia cobots

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