

# Wayne's World: Autonomy in Australia

Cobot works alongside humans

BY GEORGINA RAMIN, BOEING WRITER

## When “Wayne” enters the room, people take notice.

A rhythmic beeping and flashing orange light signal the entrance of this autonomous mobile collaborative robot – known as a cobot.

A welcome sight at Boeing's 787 Dreamliner production area in Melbourne, Australia, Wayne works on the shop floor together with human teammates. The cobot carries out tasks that previously caused repetitive strain injuries.



### ROBOT AT THE READY

Wayne waits to pick up where Boeing Australia 787 technician Joe Cascun leaves off.

PHOTO: WOODROW WILSON/BOEING

Australia is the first Boeing site to use such technology. Since its introduction two years ago, workplace injuries in the 787 area have significantly decreased. While other safety measures were also put in place during that time, the team believes Wayne played a significant role in getting the numbers down.

"Getting the 787 wing tools or mandrels ready for manufacturing in the tool preparation area was important but repetitive work," explained 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."

**SAND MAN**

Technician Josip Mihalik replaces a sanding pad on Wayne's end-effector.

PHOTO: WOODROW WILSON/BOEING



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JOSIP MIHALIK  
BOEING AEROSTRUCTURES  
AUSTRALIA

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**COBOT COLLAB**

(From left) Boeing Australia teammates Declan Burke, Josip Mihalik, Brooke Agostino, William Ko, Ashkan Amirsadri and Dominic Wierzbicki experience the benefits of robotics every day, manufacturing airplanes next to Wayne the Cobot.

PHOTO: WOODROW WILSON/BOEING



**CLEAN MACHINE**

Wayne's primary role is to sand, clean and prepare layup mandrels that are used to produce 787 components.

PHOTO: WOODROW WILSON/BOEING



Mihalik and his colleagues are reaping the benefits of Boeing's investment in R&D. Boeing Australia teammates have been coding the blueprint for safe and trusted artificial intelligence (AI) and autonomous behaviours in uncrewed aircraft and robotics.

Boeing Research & Technology (BR&T) aerospace engineers in Australia designed and engineered the autonomy built into many of Boeing's cobots. These teams are pushing the limits of what can be achieved in a complex factory environment.

You can find Wayne self-navigating around the 787 factory, avoiding people and obstacles, and using its handy mechanical arm to carry out sanding and cleaning along with manufacturing staff. The teams plan to implement a second cobot for 737 production.

Boeing Australia has long been a test bed of innovation for autonomous technology for The Boeing Company, thanks to a unique partnership between BR&T Australia and Phantom Works Global.

**DISCOVER**

Ghost Bat facts.



**SCAN**

ScanEagle intel here.



**EXPLORE**

More from Phantom Works.



### Australian-Made Boeing Autonomous Technologies



PHOTO: DEPARTMENT OF DEFENCE/COMMONWEALTH OF AUSTRALIA

**MQ-28 Ghost Bat**

The Boeing Airpower Teaming System created the first military aircraft designed, developed and manufactured in Australia in half a century. The MQ-28 is an uncrewed aircraft made to work as a smart team with other military aircraft to expand and extend airborne mission capabilities.



PHOTO: BRUCE GIBSON/BOEING

**ScanEagle**

Insitu Pacific's ScanEagle detect and avoid software enhances safe airspace integration of uncrewed aircraft systems (UAS).

**Machine-learning software**

Phantom Works Global's uncrewed technology teaches UAS to detect, decide and act during missions.

# Wayne's World: Autonomy in Australia



**WATCH**  
Wayne work the room.



### SCREEN TEAM

Machine learning specialist Dr. Zee Jan develops a digital twin demonstration for defence force customers.

PHOTO: BRUCE GIBSON/BOEING



In addition, the country offers wide-open spaces ideal for safe testing. R&D is also supported by the Civil Aviation Safety Authority and military and resource industries, all with a strong interest in integrating autonomous systems.

"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 BR&T – Asia Pacific.

The critical AI knowledge and coding skills required to develop autonomous behaviours and navigation are key factors in Boeing Australia's success. For example, the "brain" on board the mission system of Boeing's smaller test assets, the MQ-28 Ghost Bat and cobots like Wayne each have unique software that automates different tasks.

Phantom Works Global, the defence rapid-prototyping arm of Boeing Australia, tested autonomous behaviours in the early phases of the Airpower Teaming System (now known as MQ-28 Ghost Bat) and is expanding into multiple domains.

"Our focus is on creating systems that team together 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 that reduce workplace injuries to uncrewed systems protecting Australia's national interests, humans are quickly learning — as fast as the machines they make — how important these technologies are to create opportunities and confront future challenges. **IQ**

Not subject to U.S. Export Administration Regulations (EAR) (15 C.F.R. Parts 730-774) or U.S. International Traffic in Arms Regulations (ITAR) (22 C.F.R. Parts 120-130).

### MEET

the MQ-28 Ghost Bat team and go behind the scenes (aircraft previously known as Loyal Wingman).



PHOTO: PAUL SARGAISON/BRISBANE HEADSHOTS



PHOTO: BRUCE GIBSON/BOEING



PHOTO: SIMON KO

## Meet Australia's Autonomous Tech Experts

### Nathan Bick

Operations analyst, Phantom Works Global

Expert in using modelling and simulation to facilitate the process of making complex decisions.

"Working on autonomous technology and pushing the boundaries of what's possible is a fantastic experience. Our team focuses on collaboration to overcome challenges and deliver a system that successfully blends human ingenuity with the capabilities of the machines the humans themselves built. This technology increases our safety and supports our future."

### Natasha Moffat

Senior software engineer, Insitu Pacific

Leads autonomous software development to help safely integrate UAS into complex airspace.

"I love working in autonomy because everything has so much potential, the work always feels worthwhile, and nothing beats being able to flight test your work."

### William Ko

Automation research engineer, BR&T Australia

Designs and develops advanced robotic systems that enhance safety, quality and efficiency of aerospace production systems.

"At BR&T, we push the boundaries of technology, building robotic systems you cannot find anywhere else in the world. It is deeply satisfying to solve a huge range of problems unique to aerospace side by side with engineers who are the best in their fields."