

**PROJECT APN012**

# Sovereign UAS Development and Characterisation

## Project Overview

Aircraft design today is bounded by traditional material manufacturing limitations, leading to cost overruns. Often with new technologies, such as complex airframe design with new materials, the basic manufacture processes are defined with little detail.

This project will see the Quickstep and RMIT University team develop and demonstrate an optimised sovereign Uncrewed Aircraft System (UAS) airframe design for the rapidly expanding drone delivery market, with the knowledge and technology developed to be readily transferrable to other partners within the sovereign manufacturing domain.

Drawing on its innovative AeroQure technology, Quickstep will lead the design and build of this highly modular composite UAS airframe. Advanced composite manufacturing and simulation-based design and optimisation will be combined to deliver a multi-physics simulation tool, aerodynamic and structural testing, and full-scale flight demonstration, to verify the development of a cost-effective and cutting-edge airframe design.

The project is helping tackle key challenges in composite materials manufacturing, with a focus on intelligent manufacturing, automation, affordability, and performance.

It supports the upskilling necessary for critical technology implementation and know-how, while also building analysis tools for the digital value chain. And it demonstrates design integration by enhancing design processes for digital manufacturing and technology validation of certification-ready designs of UAS composite airframes through flight testing.

The multi-role capability, combined with the design for automated and advanced manufacturing techniques, will also enable Quickstep to bring utilitarian sovereign UAS capability to the global market.

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Aircraft design methodology has remained relatively unchanged for many years. While there is a plethora of UAS designs in our skies today, almost all are designed for a specific mission. The Quickstep UAS meets the requirements of a multi-mission capability by having modular aerostructure and payload configurations. It leverages a toolless, automated interface whereby a variety of payloads to suit a different missions can be identified, captured, and carried without tedious human intervention. The UAS will serve diverse use cases including bushfire fighting, tactical resupply, middle-mile logistics, and more

**Luke Preston,**  
Head of Technology and Partnerships, Quickstep

## ACM CRC Research Programs:

- RP1: Composite Materials
- RP3: Simulation and Performance Prediction
- RP4: Design and Integration

## Project Partners:

- Quickstep
- RMIT University

## Project Leader:

- Ashim Panta, Quickstep
- Prof. Pier Marzocca, RMIT University

## Year commenced:

- 2024