

TO TRANSFORM TRANSPORTATION VERTICAL AEROSPACE PARTNERS WITH HONEYWELL

Honeywell's compact fly-by-wire system is helping make urban air mobility (UAM) a reality.

Case Study

**MICHAEL CERVENKA, CEO,
VERTICAL AEROSPACE LTD.**

“Urban air mobility represents the biggest disruption aviation has seen since the dawn of the jet age in the 1960s. The combination of Honeywell’s compact fly-by-wire control systems and electrification is opening up a whole new opportunity for transportation.”

Honeywell

OVERVIEW

Founded in 2016 by Stephen Fitzpatrick, who runs the carbon-kicking energy supplier OVO, Vertical Aerospace is a British manufacturer of electric vertical take-off and landing (eVTOL) aircraft.

With a vision towards easing urban congestion and decarbonizing air travel, Vertical Aerospace is using the best technology from the aviation, energy and automotive industries to revolutionize how people fly.

Making air travel personal, on-demand and carbon free requires partners with the know-how and can-do attitude to realize the future. Vertical Aerospace partnered with Honeywell Aerospace for its Compact Fly-By-Wire system, and its ability to achieve the standards and safety integrity levels required to certify aircraft for commercial use.

Since its inception in 2016, Vertical Aerospace has grown to more than 110 world-class engineers and technical experts. The company will unveil its first passenger model in 2021, and hopes to certify a vehicle by late 2023 or early 2024.

BACKGROUND

Energy entrepreneur Stephen Fitzpatrick got the idea for Vertical Aerospace when he was stuck in traffic one day. Thinking that there had to be a better way to get around, he decided to disrupt aviation by combining the pace and agility of auto racing with the rigor and safety-first culture of aerospace.

Vertical Aerospace was born in 2016, with the idea of producing fully electric aircraft for urban environments to reduce ground congestion and create a foundation for the decarbonization of aviation.

“We want something that actually can make a real impact on society,” says Michael Cervenka, CEO at



Vertical Aerospace. “For me, [that means] having a vehicle that is really easy to fly and really easy to operate.”

To remove responsibility from the pilot – and to ultimately create a completely autonomous flying vehicle – company executives knew they had to find a fly-by-wire system – a system that replaces manual flight controls with an electronic interface – that was lightweight and technologically advanced.

“In the technology we’re developing, the pilot really isn’t flying the vehicle,” Cervenka says. “Instead, he’s telling a series of computers what he wants the vehicle to do, where to go and what

to avoid. The computer actually controls all of the different systems on the vehicle to make the pilot’s directions happen reliably and safely.”

Because fly-by-wire is a critical ingredient in the success of Vertical Aerospace’s enterprise, company executives searched far and wide to find the right system. “We looked at all the different potential suppliers in the market,” recalls Cervenka. “We did extensive due diligence before selecting Honeywell.”

QUICK FACTS

Customer

- Name: Vertical Aerospace Ltd.
- Location: Bristol, United Kingdom
- Industry: Aerospace
- Website: vertical-aerospace.com

Honeywell Installed Solution

- Compact Fly-By-Wire Control System

Customer Results

- Safety – Redundant systems smoothly adapt to changing conditions
- Stability – Automatically adjusts for turbulence and winds, increasing passenger comfort and ensuring precise takeoffs, cruise performance and landings

Why Honeywell

- Outstanding reliability and industry expertise
- Utilizes the latest in electronic processing technology to provide safety and enhance the performance of UAM platforms
- Condensed Fly-By-Wire Control System is lightweight and small, allowing greater design flexibility



SOLUTION

“We were particularly impressed with the technology Honeywell already has, as well as the kind of forward thinking about how they’re going to upgrade and keep their products competitive,” Cervenka says. Vic Terry, Head of Digital Systems at Vertical Aerospace, says that seeing the pipeline of products to come from Honeywell Aerospace, not just in the fly-by-wire but also in adjacent products, was when Vertical Aerospace knew that Honeywell Aerospace was going to be a really good partner.

Terry has also been impressed with the Honeywell Aerospace solution for being small enough to place around the aircraft very easily. “The fly-by-wire is the brains of the aircraft,” he says. “It’s a nontrivial task to integrate the components into the full system and make it work. Honeywell is working really closely with us and knocking down challenges as they come up.”

The rapport between the two teams has opened up new opportunities beyond fly-by-wire. According to Terry, “We’ve moved into working with Honeywell on

controllers because they bring some fantastic expertise there. We’re also looking at them for the wider avionics suite and our display systems, and I hope moving forward that Honeywell can bring some good technology to the autonomy piece as well.”

Vertical Aerospace is also relying on Honeywell Aerospace for help meeting new eVTOL regulations established by the European Union Aviation Safety Agency (EASA). “The regulations set a really high bar at ten to the minus nine, which is what commercial transport currently works at,” Terry says. “I really believe that this is where we should be heading as an industry, so people can trust these aircraft to deliver them where they need to get to safely.”

BENEFITS

Knowing that partnerships are critical to its success, the Vertical Aerospace team couldn't be happier with its Honeywell Aerospace relationship. "The things we looked for in a partner were the ability to hit aggressive weight, cost and safety targets," Cervenka says. "Honeywell's really stood out for me in hitting all of those criteria."

Cervenka says that Vertical Aerospace's partnership with Honeywell Aerospace has been a key differentiator in terms of providing a rapid route to market at scale. "By bringing in the best possible technologies and the best minds, Honeywell gives us a real opportunity to significantly speed up the development

cycle, de-risk the flight test program, and ultimately bring in things like F35 flight control technology to enable these vehicles to be really, really simple to fly."

With big dreams of transforming transportation as we know it, Cervenka and his team know they're getting closer to their goals with Honeywell Aerospace. He credits Honeywell Aerospace with giving Vertical Aerospace "a system that is significantly lighter and cheaper than you'd see on a conventional aircraft that will ultimately deliver the same levels of safety and reliability you'd expect on a big commercial vehicle."

Honeywell Aerospace

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