



## Novocomms Ltd : Developing the Next Generation of Satellite Positioning Technology

As demand grows for more precise, resilient positioning systems, Novocomms Ltd is helping shape the future of satellite navigation.

Through the Pivot Into Space programme, the Birmingham-based company developed an advanced proof-of-concept antenna system designed for next-generation Low Earth Orbit Positioning, Navigation and Timing (LEO-PNT) applications — technology with the potential to transform everything from autonomous vehicles to smart cities and industrial robotics.

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### The Challenge

Traditional Global Navigation Satellite Systems (GNSS) have long formed the backbone of positioning technology, but future applications demand greater accuracy, resilience and availability — particularly in challenging environments where signal reliability is critical.

NVC identified a growing opportunity in LEO-based satellite positioning systems, which are emerging globally as a powerful alternative to traditional navigation infrastructure.

The company set out to develop a compact, high-performance Ku-band ground terminal antenna system capable of supporting next-generation mobile applications.

Key project challenges included:

- Designing and developing two specialised antenna systems simultaneously within an eight-month timeframe
- Achieving high-performance beam steering and signal reliability
- Balancing advanced performance requirements with manufacturability and scalability
- Managing tight development schedules and technical complexity

The project also required rapid iteration across design, simulation, manufacturing and testing phases to refine performance and reliability.

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### The Solution

Using its expertise in advanced antenna design, NVC developed innovative omnidirectional and beam-scanning antenna technologies tailored for Ku-band LEO-PNT applications.

The project enabled the company to:

- Design and manufacture proof-of-concept antenna demonstrators
- Develop novel feed networks and reconfigurable circuitry for dynamic beam steering
- Optimise antenna performance for mobile ground-based applications

- Improve operational range, positioning accuracy and energy efficiency
- Create compact, lightweight systems suitable for next-generation positioning technologies

The programme also gave NVC the opportunity to validate commercial demand through detailed market analysis, helping identify the strongest future market opportunities for the technology.

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## The Outcome

The project successfully accelerated the maturity of NVC's LEO-PNT technology, advancing its Technology Readiness Level from TRL 2 to TRL 6 and bringing the solution significantly closer to commercial deployment.

Key outcomes included:

- Successful development of advanced Ku-band omnidirectional and beam-scanning antennas
- Enhanced capabilities in scalable, high-performance space communications technologies
- New technical expertise in dynamic beam steering and reconfigurable antenna systems
- Job creation and increased R&D capability within the business
- Stronger positioning within the emerging LEO-PNT market

Following the project, NVC secured involvement in a 24-month European Space Agency programme led by Telespazio exploring Signals of Opportunity (SOOP) positioning using Ku/Ka-band broadband satellite signals.

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## Impact

The Pivot Into Space programme helped NVC apply its specialist antenna expertise to a rapidly emerging space market, accelerating the company's transition into advanced satellite positioning technologies.

The project demonstrates how UK innovation is helping drive the next generation of resilient, high-performance global navigation systems.