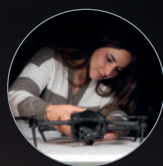




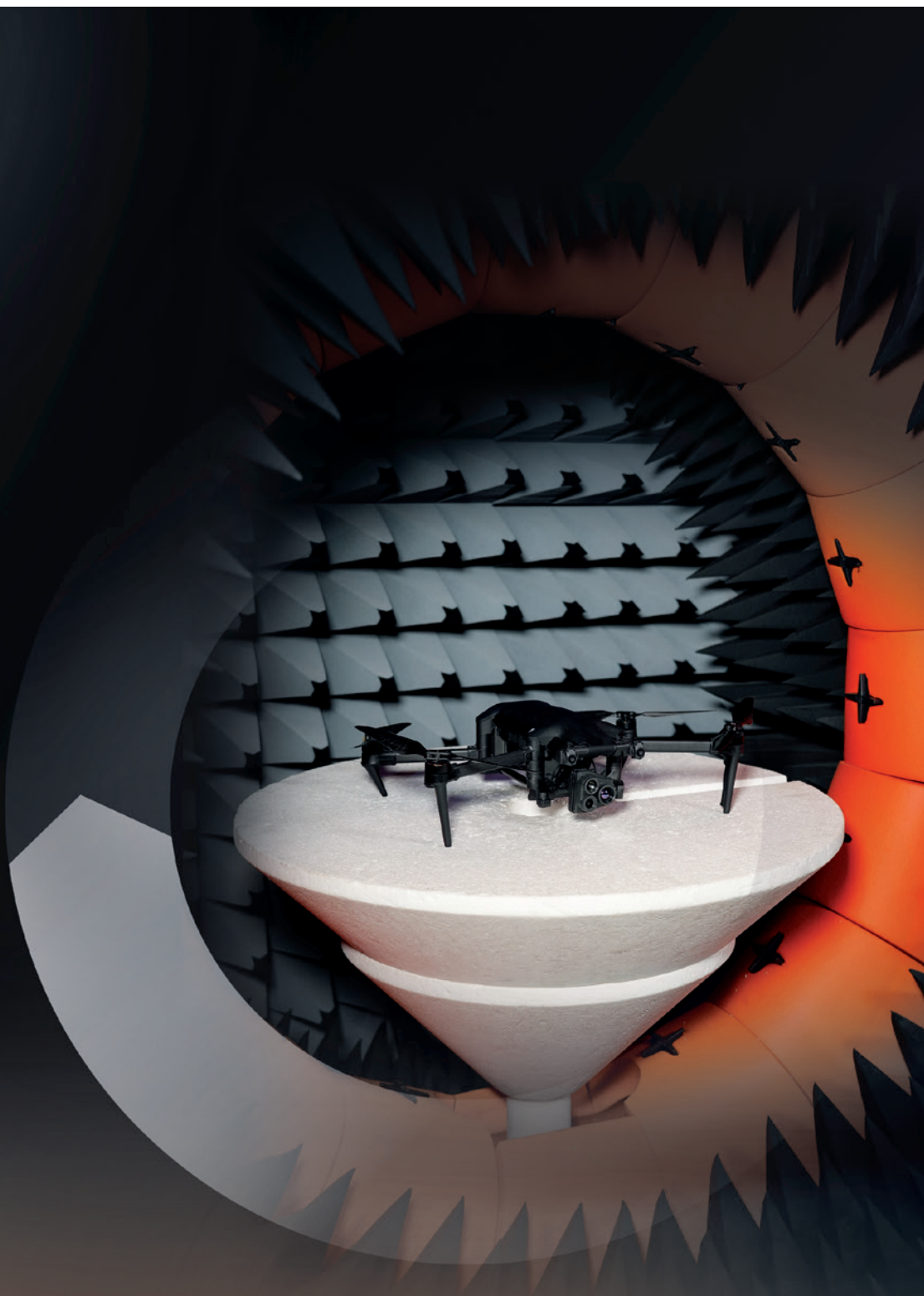
# Validating Antenna Performance for Mission-Ready Drones

## Parrot

“ With StarLab, we can refine the performance of our antennas for both drone-to-terminal communication and GNSS positioning. We use it throughout R&D to evaluate placement, ensure coexistence, and avoid coupling issues. StarLab is also a great asset for final validation at the production stage, before our drones go to market.”



Dyhia Djennadi  
RF Electronics Engineer





Beyond the technical integration, one of our biggest challenges is ensuring repeatability under real-world conditions. Drones operate in diverse and often harsh environments, so our antenna validation must go beyond the lab to truly reflect field performance”

Dyhia Djennadi



## INTRODUCTION: PIONEERING ADVANCED DRONE CONNECTIVITY

Founded in 1994, **Parrot** is one of Europe's foremost innovators in drone technology, known for designing and manufacturing **high-performance professional UAVs (Unmanned Aerial Vehicles)** that combine precision engineering, cutting-edge communication systems, and robust AI-driven data processing. Headquartered in Paris, Parrot has evolved from consumer drone production to become a **global leader in professional and sovereign drones** for defense, public safety, and industrial applications.

Driven by a mission to empower operators with **secure, resilient, and intelligent aerial tools**, Parrot integrates multiple layers of connectivity and control to ensure operational superiority in both enterprise and tactical missions. Its latest flagship models — ANAFI UKR range of micro-UAVs and CHUCK 3.0 — exemplify this approach, offering a balance of lightweight portability, advanced imaging, and multi-band communication capabilities.



## THE CHALLENGE: INTEGRATING COMPLEX COMMUNICATION SYSTEMS IN COMPACT DRONES

As drones become more sophisticated, **connectivity has emerged as a key differentiator**. Parrot's latest models integrate a complex mix of radio technologies, including Wi-Fi, LoRa, GNSS, and **secure proprietary tactical communication protocols** — along with advanced EO/IR imaging capabilities, as featured in the CHUCK 3.0 platform, designed to provide secure situational awareness and intelligence support in electromagnetically contested environments.

This presents several critical engineering and performance challenges:

- **Antenna placement and interference management:** Multiple radios must coexist in tight spaces, avoiding coupling and mutual interference while maintaining optimal signal strength.
- **GNSS robustness:** Ensuring high-precision positioning in environments where signal degradation or jamming can compromise mission accuracy.
- **Secure communication validation:** Parrot's proprietary tactical links must withstand interference and intrusion attempts, guaranteeing mission-critical reliability and data protection.
- **Production consistency:** Every drone must deliver identical, repeatable performance under varying conditions, reinforcing Parrot's reputation for dependability.



## OUR SOLUTION: EMPOWERING PRECISION CONNECTIVITY WITH MVG'S STARLAB

To meet the demanding requirements of multi-radio drone integration, Parrot chose MVG's StarLab system — a compact, high-performance solution that delivers fast, accurate, and repeatable 3D antenna measurements throughout development and production.

StarLab enables Parrot's engineers to precisely characterize antenna gain, efficiency, and directivity, both as standalone modules and when fully integrated into the drone structure. This capability allows them to:

- **Optimize antenna placement** for Wi-Fi, LoRa, GNSS, and proprietary tactical communication systems.
- **Detect and mitigate coupling or interference issues** early in the design phase.
- **Validate secure, interference-resistant links**, ensuring the reliability of Parrot's proprietary communication protocols even in harsh or contested environments.

By combining laboratory precision with production-level scalability, **MVG's StarLab provides Parrot with end-to-end confidence** — from initial concept validation to final product verification. The result is a faster, more efficient workflow that guarantees connectivity resilience and consistent quality across every unit delivered.

As Dyhia Djennadi, RF Engineer at Parrot, explains:

*"We cannot afford downtime in our measurements. With StarLab, we measure up to ten times faster than in traditional chamber setups, and can test as much as we need, whenever we want. And whenever issues arise, MVG support has always been quick and effective. We've never had an unresolved problem."*



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## + RELIABLE TESTING, COMPACT SOLUTION – BUILDING CONFIDENCE IN EVERY CONNECTION

For over a decade, **MVG's StarLab** has been trusted by leading innovators across industries — from **satellite communications to IoT, 5G, and advanced aerospace systems** — as the benchmark for **compact, high-precision antenna testing**. Its unique combination of a **small footprint, fast measurement capability**, and uncompromising accuracy has helped accelerate countless R&D programs around the world.

As wireless systems evolve toward **higher frequencies, denser integration, and more complex multi-radio architectures**, the StarLab portfolio continues to evolve with them — offering **scalable configurations, modular software suites, and a unified test platform** that bridges the gap between **research labs and production lines**.

### Empowering Parrot's Vision for Reliable Connectivity

Parrot's experience perfectly illustrates how StarLab drives innovation. By integrating MVG's compact measurement system into its development and manufacturing workflows, **Parrot ensures every antenna, every protocol, and every connection meets professional-grade reliability standards**.

*"Our drones integrate different radios, including proprietary tactical links, and their reliability cannot be left to chance. Performance testing with StarLab allows us to validate these communication channels and ensure they remain robust, even in demanding conditions."* — Dyhia Djennadi, RF Electronics Engineer



## Optimizing Performance

StarLab provides Parrot engineers with **precise 3D measurements** that make it possible to **fine-tune antenna integration** in compact drone structures. By understanding how each antenna behaves once embedded, the team can adjust placement and orientation to maximize communication and GNSS performance. This process ensures that every design iteration translates into measurable improvements, rather than relying solely on simulations.

*"3D measurements are invaluable because they show us reality, not just simulations. Every adjustment we make becomes tangible and measurable – and that's when we see the real difference in the field."*

## Ensuring Consistency

Performance validation is not limited to R&D. Parrot also uses StarLab for production-level testing, ensuring that **antenna performance remains consistent from prototype to final unit**. This continuity is essential for professional drones, where any behavior drift can affect mission success. By embedding StarLab checks in their workflow, Parrot reinforces the dependability of their platforms at every stage.

## Securing Tactical Communications

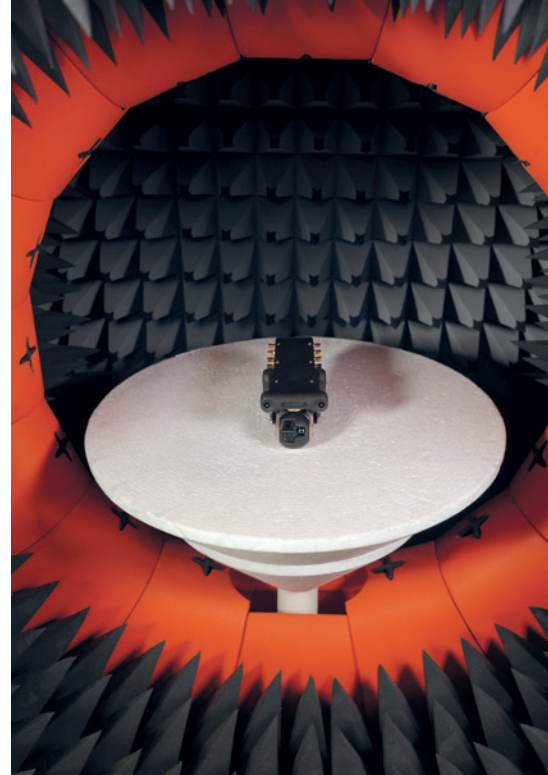
In defense and security applications, **connectivity resilience is non-negotiable**. Parrot leverages StarLab's controlled and repeatable testing environment to validate **proprietary tactical communication protocols**, confirming their resistance to jamming, interference, and cyber disruption. This capability provides operators with **confidence in secure, uninterrupted links – even in hostile environments**.

*"In critical missions, failure is not an option. Our customers must trust that their communication will never drop, even under extreme conditions. Starlab gives us the confidence to guarantee that."* — Dyhia Djennadi, RF Electronics Engineer

## Preparing for the Next Generation

Looking ahead, Parrot is preparing its systems for **next-generation connectivity** by integrating **5G antennas** into upcoming platforms. This evolution supports higher data throughput, reduced latency, and extended control range — all crucial for mission flexibility and real-time operations. To maintain its technological edge, Parrot is also evaluating **Over-The-Air (OTA) testing** methods to assess both commercial and proprietary communication systems under realistic conditions.

This forward-looking approach underscores Parrot's commitment to **delivering resilient, interoperable, and future-ready drones**, capable of adapting to the expanding demands of connectivity, autonomy, and tactical communication.



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## Testing Connectivity for a Wireless World

The Microwave Vision Group offers cutting-edge technologies for the visualization of electromagnetic waves. With advanced test solutions for antenna characterization, radar signature evaluation and electromagnetic measurements, we support company R&D teams in their drive to innovate and boost product development.



For more information:  
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