

Wireless Connectivity Testing for the Drones of the Future

Parrot

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After installation and a day of training, the StarLab immediately became an essential tool in the development and connectivity testing of Parrot drones. We noticed the difference instantly. Thanks to the StarLab, we are now able to give preference to measurements over simulation which optimize the design and the integration of our antennas.



Meryam Abou El Anouar,
*Technical Leader,
RF & Connectivity
Team at Parrot
Drones*



The challenge

The world's second largest manufacturer of general public drone technology, Parrot Drones, required an antenna testing solution in its development phase which would not only help them meet all relevant testing and operational standards, but would also optimize the performance of its new products for localization, reliability and range.

Space was a key concern, with only a small footprint available for the new testing device.

Considered a visionary at the forefront of innovation, Parrot Drones' products and software are renowned for performance and ease of use. With almost 600 employees, the innovator is the only manufacturer of its kind to offer the full suite of equipment, software and services.

The arrival of 4K cameras and the increasing popularity of drones for recreational and commercial use, is driving an industry-wide need for improved range, reliability and speed. Consumers now demand high-quality connection, accurate GPS positioning and HD images as standard in a market-

leading drone. To deliver this in a highly competitive market place, Parrot Drones knows that the key lies in accurate visualization of electromagnetic waves during the product development phase.

Drones have severe mechanical constraints and require the use of complex materials. It's no surprise therefore that there are usually numerous design changes during their development. In this context, existing electromagnetic simulation tools do not guarantee the correct operation of the end product, making precise antenna testing essential.

Our solution

Historically, Parrot Drones used a 2D antenna measurement system which provided only the main cross-sections of the radiation pattern, but as drone technology became more sophisticated this technology became obsolete and the manufacturer switched to 3D radiation pattern measurements.

Initially, Parrot Drones developed its own 3D measurement solution, based on an anechoic chamber and two axes of rotation, but this solution proved too restrictive and time-consuming at a time when new products were being launched in quick succession. Keen to adopt a highly accurate and compact antenna testing solution, which would accelerate the team's ability to not only measure, but visualize, electromagnetic waves, they turned to the expertise of MVG.

"I knew of MVG and the multi-probe systems they had developed. Ours was only a single-probe solution, so I knew straight away that an MVG system would be at least 10 times faster. However, we didn't have the space for a system of this size.

Upon speaking with MVG's specialists, a solution quickly became clear; StarLab boasted dimensions which were suited to laboratory use, and it offered a perfect level of performance for our requirements. The ease of measurement has changed the way we worked. We used to make many simulations by approximating the characteristics of non-standard materials that make up our drones'.", recalls Meryam Abou El Anouar, Leader of RF and Connectivity at Parrot Drones.



Maximum testing, minimal footprint



The **StarLab** is a compact system specially designed by MVG for antenna pattern measurements in laboratories and production environments where space is limited.

It combines the flexibility of a portable system with the reliability of a laboratory tool able to precisely measure the performances of a product at each stage of its design. It can measure several parameters in the 6 GHz (650 MHz to 50 GHz), 18 GHz (650 MHz to 18 GHz) and 50 GHz (650 MHz to 50 GHz) frequency bands, including: gain, directivity, beamwidth, antenna efficiency, radiation pattern, TRP, TIS, EIRP and EIS.

Overcoming the issue of footprint opens the doors for equipment manufacturers, like Parrot Drones, looking to refine their product development processes through the accurate measurement of electromagnetic waves. The measurement result helps deliver to market products offering unrivalled antenna performance.



“The StarLab is so simple to use, we are able to post check some products during the production process. We can precisely measure, particularly for GPS, the dispersion of antenna’s performances”

Meryam Abou El Anouar, *Technical Leader, RF & Connectivity Team at Parrot Drones*

Optimizing antenna performance

Meryam comments on how Parrot Drones uses its new StarLab system: “In the product development process, the StarLab is an asset for us. We use it to refine the connectivity of all our new models, checking that our antenna, or those of our suppliers, comply with our specifications even once they have been integrated into, and therefore affected by, the surrounding structure which modifies their characteristics.

“For GPS antennas, we seek to maximize the visibility of satellites, whilst for the four antennas located in the feet of the drone, we use the StarLab to optimize the gain in the direction of the remote control or the telephone using a Wi-Fi MIMO strategy developed in collaboration with the Signal Processing department”.

Satisfying standards

Manufacturing products with built-in Wi-Fi means Parrot Drones must meet strict standards regulating the transmission power of each new model. In order to calculate power

transmission, they must accurately measure the antenna gain.

Meryam continues: *“In previous years, using 2D radiation patterns meant we ran the risk of incorrectly determining the maximum gain, but the StarLab has solved that problem using 3D measurements to work out the gain with a high degree of accuracy. With such reliable readings, we can adjust the transmission power to ensure compliance with all relevant standards. We know this gives us a competitive edge over our competitors who do not have precise 3D measuring tools.”*

Future development

With a number of exciting new drone technologies in development, Parrot Drones is particularly focusing on professional equipment, such as the Parrot Bluegrass Fields. Drones for commercial use require even higher accuracy of GPS positioning which imposes serious constraints on the antenna. The StarLab proves integral to the development of these new products.

MVG - Meeting the Testing Challenges of a Fully Connected World

The Microwave Vision Group (MVG) has developed unique expertise in the visualization of electromagnetic waves. These waves are at the heart of our daily lives: smartphones, computers, tablets, cars, trains, planes - these devices and vehicles would not work without them. MVG expertise brings measurement solutions to R&D teams for the characterization of antennas and their performance within these devices, and chamber solutions for EMC testing. MVG innovation remains focused on supplying the world with the most advanced EMF measurement technology to date.

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Our teams, in offices around the world, guide and support you from purchase, through design, to delivery and installation. Because we are local, we can assure speed and attention in project follow through. This includes customer support and maintenance once the system is in place. For the exact addresses and up-to-date contact information: www.mvg-world.com/mvg-offices



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