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Saab completes world-first Quantum Timing radar trial

Saab UK, Aquark Technologies and Royal Navy Disruptive Capabilities and Technologies Office (DCTO) have successfully completed a UK trial showing how a military radar network can continue operating without GPS timing.

The trial integrated Saab's Giraffe 1X radar capability with Aquark's AQlock quantum technology and is believed to be a world-first demonstration of a distributed high-performance military radar network maintaining a coherent operational picture using independent quantum timing sources.

The trial showed that Giraffe 1X radars operating at separate locations can continue combining tracking data into a single, accurate air picture, even when satellite-based timing was unavailable or compromised. For operators, this capability provides a coherent view of the battlespace, supporting effective decision-making if satellite-based timing services are unavailable or cannot be trusted.

Modern radar networks depend on precise time synchronisation to combine data from multiple sensors and present operators with a single, accurate view of the airspace. Traditionally, this timing is provided by Global Navigation Satellite Systems (GNSS), such as GPS. However, GNSS signals are increasingly vulnerable to jamming, spoofing and disruption in contested environments, which can degrade the quality of the combined radar picture.

During the trial, multiple Giraffe 1X radars tracked live targets whilst operating with independent AQlock quantum timing sources. The team then introduced controlled timing errors to replicate GNSS spoofing and denial scenarios to assess the impact of timing disruption on the combined radar picture.

The demonstration confirmed:

- Successful operation of Giraffe 1X radars at separate locations using independent quantum timing sources.
- Generation of a single, coherent air picture without GNSS timing.
- Predictable performance degradation under timing disruption.
- Rapid recovery when synchronisation was re-established.
- Continued operation under representative GNSS-denied and GNSS-spoofed conditions.

Andy Fraser, Group Managing Director at Saab UK, said:

"This trial is a great example of how collaboration can accelerate innovation. By combining quantum timing technology with Saab's advanced Giraffe 1X radar system, we have demonstrated a practical capability that could help customers continue to operate effectively when it matters most."

Quantum timing systems can maintain highly accurate time for much longer than conventional technologies without relying on GPS or other external signals. This allows critical systems to remain synchronised and continue operating effectively

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when satellite-based timing services are unavailable, disrupted or compromised.

The trial brought together Saab UK, Aquark Technologies, the Royal Navy and QinetiQ, highlighting the role of collaborative innovation in developing next-generation defence capabilities for increasingly contested operating environments.

Saab UK Ltd, a legal entity of Saab AB, is a leading defence and security company. With around 600 employees and a presence in the UK for more than 30 years, Saab operates 8 major facilities across the country, including training and simulation in Wiltshire, Seaeye underwater robotics and sensor systems in Fareham, Public Safety Solutions in Hull, a Software Technology Centre in Farnborough, and its headquarters in London.

The UK is a key country of operations for Saab. Over 60% of Next generation Light Anti-tank Weapon (NLAW) comes from UK supply chain and 35% of the Gripen fighter jet is sourced from UK companies creating thousands of jobs.