Active Electronically Scanned Array Multi-Mode Surveillance Radar

Introduction

SELEX Galileo's Seaspray and PicoSAR range of Active Electronically Scanned Array (AESA) Multi-Mode Surveillance Radar uses modular technology 'building-blocks' found in all current generation high performance fighter radar systems. The technology and the capability that it delivers have experienced a digital revolution in the last 20 years that closely mirrors that seen in consumer electronics and communications products.

Despite this, Seaspray and PicoSAR are unique in deploying this technology in this class of system; they are the 'Blu-ray Disc' radar systems in a market of 'VHS Tape' competitors. Through the flexibility that this technology offers to the radar system designer, they are able to provide optimum waveforms for all modes, superior difficult target detection capability, pulse to pulse mode interleaving and best-in-class reliability and availability that are directly reflected in significantly reduced Through Life Costs.

Product Capability

Seaspray

Seaspray is offered in three configurations, broadly aligning to the requirements of light twin turbo-prop surveillance aircraft, naval helicopters and Long Range Maritime Patrol Aircraft (LRMPA). They are all high performance, Low Probability of Intercept (LPI) multi-mode surveillance radar systems operating in X Band. Each comprises of just two Line Replaceable Units (LRUs); the Scanner and the Processor.

The Processor is common to all three Seaspray models, providing commonality in terms of modes and functionality. The Scanner is available in a range of sizes that makes them suitable for the full range of surveillance platforms, from the smallest, e.g. Tactical Unmanned Air Vehicles (TUAV), to LRMPA. In each case they comprise of a pedestal mounted array of multiple solid-state Transmit Receive Modules (TRM). They effectively combine the Transmitter, Receiver and Scanner LRUs of traditional Mechanically Scanned (M-Scan) radar systems into the single Scanner LRU. The AESA technology has eliminated the need for complex and inefficient aircraft waveguide installations. Whilst they are interface rich, their primary interface is via Ethernet, making them highly flexible in terms of installation and integration, providing the opportunity to readily add additional independent operator workstations as customers' requirements evolve.

- Seaspray 5000E, at less than 45kg, is the smallest of the Seaspray radar systems. It is the 'entry-level' standard of multi-mode surveillance radar and is appropriate for light naval helicopters and twin turbo-prop surveillance aircraft, such as the Eurocopter Dauphin or King Air 350, or larger platforms. Seaspray 5000E is in production and under contract to upgrade a fleet of naval Sea King helicopters.

• Seaspray 7000E, at less than 80kg, is the mid range Seaspray radar system. It is the direct successor to the many hundreds of previous generation technology Seaspray radar systems that are in service world-wide, and is appropriate to medium naval helicopters and Maritime Patrol Aircraft (MPA) such as the AgustaWestland AW159 and Alenia Aeronautica ATR 42 and 72, or other platforms. Seaspray 7000E is in service, in production and under contract on a range of programmes for platforms including AW159 and SH-3D naval helicopters and Beechcraft 200, King Air 350, CASA CN235, Fokker F27 and Alenia Aeronautica ATR72 MPA.

• Seaspray 7500E, at less than 110kg, is the largest of the Seaspray radar systems. It is the highest performance system, and is appropriate to large naval helicopters, LRMPA and Medium and High Altitude Long Endurance Unmanned Air Vehicles (MALE and HALE UAVs) such as the AgustaWestland AW101, the Lockheed Martin C-130 and the General Atomics Predator, or other platforms. Seaspray 7500E is in service, in production and under contract on a range of programmes for platforms including the US Coast Guard HC-130H LRMPA and the US Custom and Border Protection King Air 350 Multi-Role Enforcement Aircraft (MEA).

They all feature an extensive common mode suite that includes surveillance and high resolution SAR and ISAR imaging modes covering maritime, land and air surveillance requirements.

PicoSAR

The PicoSAR is a small, single LRU radar weighing less than 10kg that uses the same X Band radar modular technology 'building-blocks' to provide an unrivalled, all weather land surveillance capability for TUAV and light surveillance aircraft such as the SELEX Galileo Falco and Britten Norman Defender, and other platforms. It provides high resolution Spot and Strip Synthetic Aperture Radar (SAR) ground mapping and Ground Moving Target Indication (GMTI) modes. It has been demonstrated on a range of fixed and rotary wing manned and unmanned air vehicles in Europe, the US and the Middle East. It is in production and has been delivered to customers, with programmes in Europe and the Far East.

Future Developments

SELEX Galileo continues to invest in this product range and is developing smaller, lighter and higher performance capability systems to be introduced in the coming years.

Conclusion

The Seaspray and PicoSAR range of AESA Multi-Mode Surveillance Radar systems is setting the standard for high performance tactical Intelligence, Surveillance, Target Acquisition, and Reconnaissance (ISTAR) radar systems. "The Seaspray and PicoSAR radars have been trailblazing the application of AESA technology in the multi-mode surveillance radar market for the last five years" said Alastair Morrison, SVP of radar and advanced targeting "and they have been comprehensively embraced by the market. With these products customers are able to buy-in to a next generation capability that is at the

beginning of its technology life cycle, and this is well understood by the large number of international customers who have already selected them".

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