THALES

> SMART-S Mk2

General

SMART-S Mk2, the newest Thales Naval 3D multibeam radar, is optimized for medium-to-long range air and surface surveillance and target designation. This state-of-the-art radar is an excellent performer in complex littoral environments with their mix of sea, land, rain, thunderstorms and targets such as multiple small surface ships, helicopters and anti-ship missiles. The detection range allows the full performance of new medium-range SAM-systems such as ESSM. Graceful degradation through the use of multiple solid state transmit modules and multiple receive channels ensures robust performance throughout the spectrum of military operations.

Through the use of Doppler processing SMART-S Mk2 can detect even the stealthiest of targets in a cluttered environment by measuring radial speed directly. As a multibeam radar SMART-S Mk2 offers the long dwell time per target required for good radial speed measurements.

SMART-S Mk2 is an optimal sensor for target indication to a fire control tracking system. By providing 3D tracks the radar supports correct classification and rapid acquisition. The elevation accuracy is high (even in the case of multipath by using receive beams below the horizon) and suited to directly launch fire and forget missiles. SMART-S Mk2 is well suited for detection of helicopters due to dedicated rotor hub detection capabilities. For guidance of helicopters and UAVs it can use very short pulses, providing a short minimum range.

SMART-S Mk2 is designed for ease of maintenance and can support maintenance free missions. This is achieved by reducing single points of failures (graceful degradation), high MTBF per component, low MTTR and solid-state transmit modules.

SMART-S Mk2 is easy to install on board. The antenna uses electronic stabilization. The solid state transmit modules are integrated in the antenna meaning no separate transmitter cabinet and waveguide are required. Foot print reduction is achieved through the use of powerful processing boards housed in a single processing cabinet. Total system weight is significantly less than comparable 3D G-band radars!

Main characteristics

- Excellent performance in the Littoral environment
- Supports full performance of ESSM
- Solid State Transmitter integrated in the Antenna
- Very small below deck footprint; just 2 small sized cabinets
- Easily integrated with many CMS systems (Open Standard Interface and Thales' TACTICOS Interface)
- Short-range capabilities for helicopter and UAV control and surface detection
- IFF antenna and optional integration with IFF system.

Medium-to-long range 3D surveillance radar
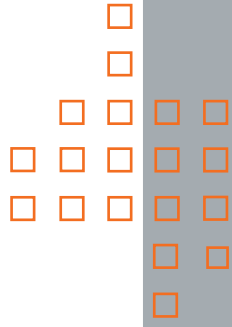
SMART-S Mk2
Medium-to-long range 3D surveillance radar

Functional Aspects

- 3D Air Surveillance with Fast Target alerts
- Surface Surveillance
- Surface Gun Fire Support
- Jammer Surveillance
- IFF Interrogation Support

Functional Aspects

- Maximum Instrumented range: 250 km
- Maximum elevation coverage: 70 degrees
- Minimum Range: 150 meters
- Tracking 3D capacity (Air+Surface): 500 targets
- Surface Fire Control Windows: 3
- Elevation accuracy: < 10 mrads
- Bearing accuracy: < 5 mrads
- Range accuracy: < 20 meters
- Detection performance: Small missile ~ 50 km
  MPA ~ 200 km

Technical Data

System:

- Two operating modes: medium range up to 150 km at 27 RPM and long range up to 250 km at 13.5 RPM
- Fully automatic detection and tracking in both modes. The operator can select mission specific settings and override the tracking process.
- Dedicated ECCM techniques.

Antenna:

- Antenna beam width (bearing): approx. 2 degrees
- Antenna rotation speed: 13.5/27 RPM
- Stabilization: electronic
- Very low sidelobes

Transmitter:

- Frequency band: E/F-band (excl. ATC and communication bands)
- Type: Solid State transmit modules integrated in Antenna

Processing:

- Digital beamforming, resulting in 12 simultaneous receive beams
- Multipath suppression using a beam under the horizon
- Digital pulse compression
- Doppler filtering based on FIR techniques
- Advanced CFAR techniques
- Multiple hypothesis tracking based on multiple target models
- Classification support

The design and construction of the equipment are based on current NATO standards for shipborne equipment.

System Overview
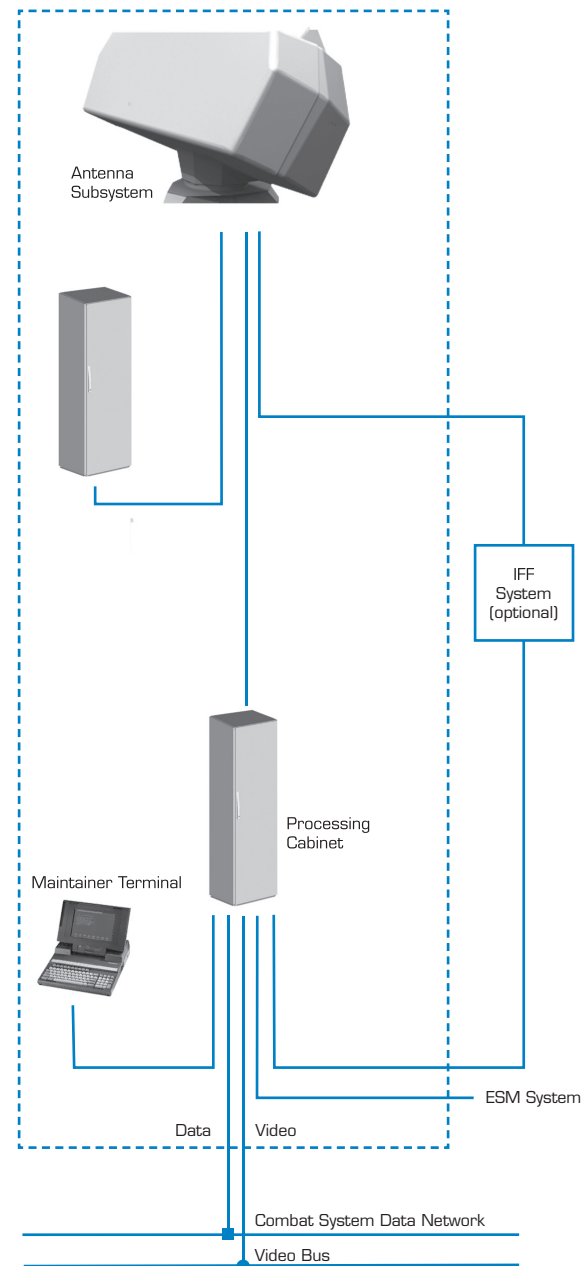
SMART-S Mk2 has an extremely small below deck footprint

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