

SMART-L

General

SMART-L is a 3D multibeam radar designed to provide long range air & surface surveillance and target designation. SMART-L is capable of automatic detection, track initiation and tracking of up to 1000 air targets and up to a range of 400 km. It is a further evolution in the long line of Thales 3D multibeam radars, incorporating state-of-the-art technology and additional advanced radar functions. Designed in accordance with NATO specifications for a Volume Search Radar, SMART-L fulfils the following requirements:

- Medium range detection of the newest generation of small 'stealth' air targets
- Long range detection of conventional aircraft
- High ECCM performance
- Guidance support for patrol aircraft
- Surface surveillance

SMART-L's large power budget allows for the early detection and tracking of very small aircraft and missiles. The accurate 3D target information, gathered by the SMART-L radar, provides an essential contribution to the threat evaluation process, especially in multiple attack scenarios and it allows the weapon control system to lock-on rapidly.

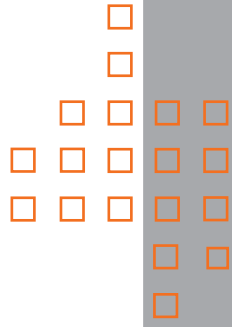
SMART-L operates in the D band, former L band.

The antenna consists of a planar array antenna with low side-lobes and is electronically stabilised. The received radar energy is processed by parallel receiver channels.

Digital beamforming techniques are used to perform target elevation measurements using the Multibeam principle. The long dwell time characteristic of Multibeam processing allows coherent Doppler filtering to be applied. Extraction of the target Doppler speed leads to unparalleled clutter suppression and an instantaneous target radial velocity determination at plot level, allowing for a combination of fast track initiation and low false track rate. Track reports are transferred to the command and control system and high quality plot data to an MFR or FCR.

Main characteristics

- Automatic detection, track initiation and tracking in 3D for air targets
- Mission selectable illumination patterns as well as a burn through pattern
- Fast reaction mode for the initiation of cued search by MFR or FCR
- Accurate low elevation measurement by use of multipath suppression features
- Low antenna side lobes against side lobe and main lobe jamming
- Automatic least jammed frequency
- Simultaneous air- and surface surveillance channels
- Graceful degradation by applying Solid state transmitter
- Electronic stabilization
- Automatically functioning built-in test facilities.
- Easy to use.



SMART-L

3D long range surveillance radar

Functional Aspects

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

Performance Data

Maximum free-space detection range

- Stealth missile : 65 km
- Fighter : 220 km
- Patrol aircraft : 400 km

Tracking capacity

- Air targets : 1000
- Surface targets : 100
- Jammer tracks : 32

ECCM and anti-clutter facilities

- Broadband frequency and least jammed frequency operation
- Very low antenna sidelobes in azimuth and elevation
- Doppler FFT processing, radial speed determination and automatic thresholding of clutter and jamming
- Clutter map and jamming map
- Burn-through illumination pattern
- Sector emission and emission control capabilities

Technical Data

Antenna

- Polarization : vertical
- Horizontal beamwidth : 2.2°
- Vertical beamwidth Tx : 10 to 70°
(illumination pattern dependent)
- Illumination patterns : Local Area, Long Range and Burn Through
- Vertical beamwidth Rx : 14 beams of approx. 6°
- Stabilisation : Electronic
- Rotation speed : 12 rpm
- Integrated IFF antenna

D-band transmitter

- Amplifier type : solid state
- Transmitting modes : sectorwise reduced or full power
- Frequency modes : limited and full frequency agile

Processing

- Digital beamforming, resulting in 14 simultaneous receive beams
- Multipath suppression using two beams under the horizon
- Doppler filtering based on FFT techniques
- Advanced CFAR techniques
- Multiple hypothesis tracking
- Classification support

Dimensions and Weight (max. values)

	Width (mm)	Height (mm)	Depth (mm)	Weight (kg)
Antenna system	Ø10000	5000	-	7800
Drive control cabinet	655	1821	629	200
Climate system:				
- Temperature control unit	2052	1892	745	900
- Humidity control unit	955	820	555	72
- Climate control and monitor unit	961	1052	415	120
Transmitter cabinet	2525	2218	1130	2640
Video processing cabinets:				
- VPCA	909	2087	569	275
- VPCB	909	2087	569	231
- VPCC	909	2087	569	231

Power Requirements

Main equipment	440 V	60 Hz	3 ph	130 kVA
	115 V	60 Hz	3 ph	10 kVA
Anti-condensation provision	115 V	60 Hz	1 ph	0.5 kVA
Ship's cooling water	3.6 l/s	(max. temp. 9°C)		

Environmental Conditions

The design and construction of the equipment are based on current, international military standards for shipborne equipment.

System Overview

