



LEONARDO ELECTRONICS

KRONOS[®] Grand Naval HP



KRONOS® Grand Naval HP is a Multifunctional Extended-Range C-Band Radar within the KRONOS® family of Active Electronic Scanning Antennas (AESA) systems, simultaneously operating as a Surveillance Radar and Multiple Fire Control Radar. It is designed to counter new-generation threats in all types of Electronic Countermeasure (ECM) conditions and in severely clutter-hampered environments.

KRONOS® Grand Naval HP is optimised for Surface-to-Air Anti-Missile-Extended Self Defence (SAAM-ESD). The system uses new, highly efficient GaN components in the antenna Transmit/Receive Module (TRM), placing KRONOS® Grand Naval HP at the top of its market segment for detection range. The system integrates IFF (Identification Friend or Foe) interrogation modes 1, 2, 3/A, C, S, 4, and 5

KRONOS® Grand Naval HP is designed as the primary sensor for medium and large vessels, including offshore patrol vessels, landing helicopter docks, and aircraft carriers. It draws on Leonardo's extensive experience in supplying advanced multifunction radars to the Italian Navy and international customers, and represents the most advanced solution in a C-Band sensor.

KRONOS® Grand Naval HP can fulfil many mission types:

- Air & Sea Surveillance and Tracking
- Extended Self-Defence and Local Area Defence against Air-Breathing Targets
- Anti-Tactical Ballistic Missile (ATBM) defence against TBMs (up to Tactical Ballistic Missiles - TBM - class 1300)

KEY FEATURES

- Ship Self-Defence
- Naval Area-Defence
- Fleet protection
- Active Missile Guidance (Uplink)
- Air & Sea Surveillance
- Littoral Warfare
- Gunfire Support
- ATBM Defence (TBM600 Autonomous, TBM1300 on CUE)



By scanning the beam in both azimuth and elevation, KRONOS® Grand Naval HP grants optimal performance in:



Surveillance

Up to 300 km with electronic pitch and roll compensation:

- Air surveillance
- Sea/Surface surveillance



Tracking

Up to 90° in elevation:

- Dedicated beam pointing centred on enemy threats (dedicated tracking)
- Optimised waveforms matched to target characteristics to maintain detection probability in severe clutter scenarios
- Threat evaluation for each track based on its kinematics, assigning a danger level and an appropriate tracking technique
- According to the Threat Evaluation results, different priorities and tracking techniques, with different refresh rates are assigned to the threat:
 - HPT (High Priority Tracking) with a nominal update period of 1s
 - LPT (Low Priority Tracking) with a nominal update period of 4s
 - TWS (Track While Scan) with the Surveillance Operative Mode update period
- Target classification (Surface/Naval, TBM, Supersonic Air Target, Subsonic Air Target, Helicopter)
- Multi-beam activities (in the event of fading, to search for highly manoeuvring threats within a wide predicted area to maintain tracking, or in the event of 2D/3D external designation, to search for the target within a wide area to detect it).



Firing

- Fast track initialisation (up to 1s after detection)
- Threat and Own Missile tracking with renewal time of 1s for active missile guidance
- Uplink for Own Missile guidance (ASTER Missiles)
- Gunfire support.



ECCM

- Emission CONTROL (EMCON)
- Staggered PRT waveform
- Wideband high-frequency agility
- Automatic Least Jammed Frequency Selection
- Side Lobe Blanking (SLB) with a dedicated channel
- Jammer detection and jammer map creation
- Track-On-Jammer (TOJ) and Burn-Through (BT)
- Jammer Cancellation
 - Side Lobe Cancellation (SLC)
 - Main Beam Cancellation (MBC)

TECHNICAL MAIN FEATURES

SURVEILLANCE/ TRACKING/ENGAGEMENT	Instrumented range:	up to 300km
	Elevation coverage:	up to 90°
	Update rate:	up to 1 second for dangerous targets
	Target RCS:	from 0.01 sqm
	Total number of tracks:	up to 500 tracks
	Contemporary engaged targets:	up to 30 engaged track (in High Priority Tracking)
ANTENNA GROUP	Active fully-phased array	
	C-Band	
	#TRM:	2272 (1 for SLB)
	#Columns:	28
	# Contemporary RX Beams:	Pencil Sum Δ Az, Δ EI, SLB
	Scanning capability:	$\pm 45^\circ$ Az, $\pm 60^\circ$ EI
PROCESSOR UNIT	Cooling Type:	Liquid
	FF Receiver (IFR)	<ul style="list-style-type: none"> • IF Filtering • Analog STC • AGC
SYSTEM MANAGER	Activities scheduling, such as search and dedicated tracking on multiple targets	
	Track classification, track priority assignment, adaptive waveform selection for tracking activities	
	ECCM management (SLB, AFS, jammer detection and classification, TOJ, BT)	
	BITE and Calibration	
SIGNAL PROCESSOR	IF sampling	
	DDC/DPC	
	Clutter Estimation and Removal	
	Coherent Integration (MTD)	
	SLC/MBC	
	TX waveform generation	
	LOs generation	
RADAR CONSOLE UNIT	Maintenance	<ul style="list-style-type: none"> • Maintenance commands • Primary Control command • Operative commands
	Display	<ul style="list-style-type: none"> • Radar Status • PPI • BITE info • Primary Control
	Commands	<ul style="list-style-type: none"> • Operative commands

For more information:
infomarketing@leonardo.com

Leonardo Electronics
Via Tiburtina, Km 12,400 - 00131 Rome - Italy
T +39 06 41501, F +39 06 4131133

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