

LEONARDO ELECTRONICS

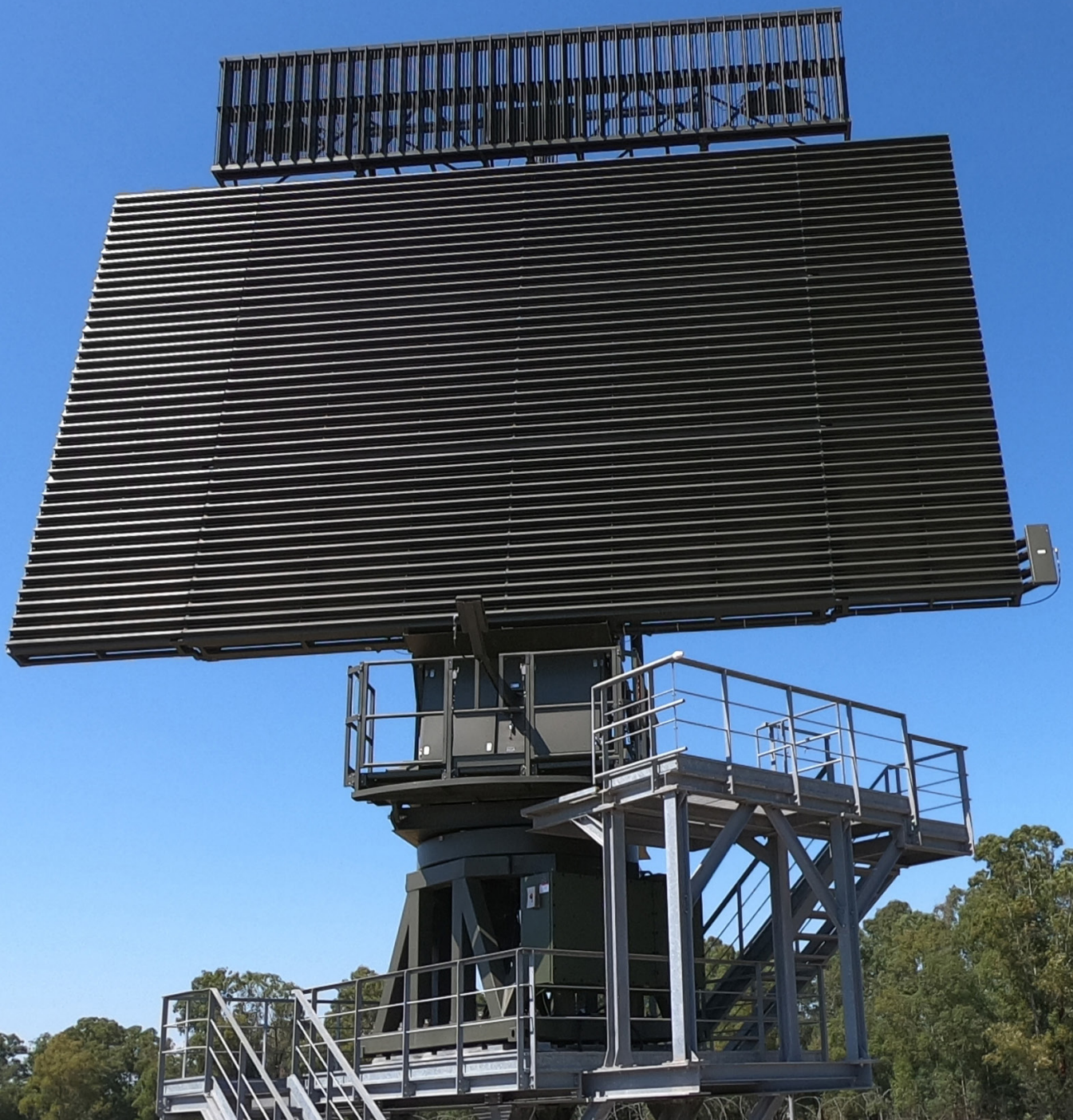
RADAR SYSTEMS FOR GROUND BASED AND NAVAL OPERATIONS

INTRODUCTION

The company's advanced surveillance and protection capabilities guard against air and missile threats (including ballistic missiles), both for homeland security and in expeditionary environments. They protect blue forces and assets in out-of-area operations, at major events, and safeguard critical network infrastructures. Our advanced joint C4I systems, fixed or deployable, permit immediate planning, tasking and execution of missions based on real-time Situational Awareness of the current scenario. Low, medium and high coverage of the surrounding airspace, together with early warning and very short reaction time response, are ensured by the presence of long/medium-range and battlefield surveillance sensors.

The company provides also total solutions for naval requirements through the whole warship lifecycle. Today, all modern navies need to comply with evolving mission scenarios. These include peacekeeping operations, shipping lane patrols, piracy deterrence, exclusive economic zones surveillance and oil platform protection, as well as search & rescue activities. To meet these requirements, we develop and deliver naval systems and state-of-the-art technology radars offering high operational flexibility, leveraging a design approach based on its learning-by-doing philosophy. Its international footprint has been achieved delivering the best-in-class radar sensors in service with major customers worldwide.

The company has embraced a high-level strategy for ensuring continued advancement in our core technology areas. This process, underpinned by constant activity by our in-house laboratories devoted to specific areas of applied research, promotes the effective integration of new, innovative components within our existing capability portfolio. A key element of this strategy is the development of AESA radar capability based on the company's fully owned GaAs and GaN technologies.



RAT-31DL

L-Band Solid-state 3D Air Surveillance Radar

The RAT-31DL is an advanced L-band solid-state radar with AESA antenna, effective to a range of over 470km, Initially designed to meet radar NATO Class 1 requirements, it has met with worldwide success and appreciation and it is being continuously upgraded with the most advanced HW and SW technologies. The latest full digital version integrates GaN TRMs, digital signal distribution and processing, Digital Beam Forming (DBF). These upgrades allow the RAT 31 DL to improve its already top class capabilities, particularly in the detection of high speed targets (i.e. ballistic missiles) and low RCS (Radar Cross Section) targets; increasing the already high system reliability and reducing the overall operational costs. Thanks to its highly modular and flexible architecture the latest features can also be retrofitted to the proven mechanical architecture of existing operational systems. The RAT-31DL detection performances are maintained in a broad spectrum of operational scenarios where jammers coexists with heavy clutter. It uses multiple simultaneous independently phase controlled pencil beams. Each beam provides monopulse altitude measurements with excellent accuracy, even in the frequency agility mode. Reduced peak power, sidelobe antennas, frequency agility, jam strobe reporting, separate receiver for ECM monitoring provide resistance against Anti-Radiation Missile (ARM) and Electronic Counter Measures (ECM). The mechanical configuration is designed to facilitate assembly/ disassembly for system relocation.

RAT-31DL/M

Deployable 3D Long-range Radar

The RAT-31DL/M is the transportable version of the RAT31-DL. It is designed to be fully compliant with NATO criteria and standards, including Tactical Ballistic Missile (TBM) detection. The RAT-31DL/M is a light, compact, 3D long-range range air defence radar combining Primary Surveillance Radar (PSR) and a Secondary Surveillance Radar (SSR) supporting identification Friend or Foe (IFF). The radar is easily integrated with remote systems, (e.g. Control and Reporting Centres, Air Operation Centres), to which it provides primary plots, identification (SSR) plots, associated plots, TBM tracks, jam-strobe data, ECM data and from which it can receive "operational" and "functional" commands. The RAT-31DL/M (or DADR-Deployable Air Defence Radar) is an advanced L-band, solid-state, phased array, 3D air surveillance radar, effective to a range of 400km. It is a state-of-the-art radar system designed to operate within modern military air defence systems. The RAT-31DL/M is completely adaptive to the operational environment with simultaneous and independent scanning beams, multi-range modes, and well-proven anti-clutter and anti-ECM features. It has a monopulse antenna, forming simultaneous sum and difference elevation and azimuth patterns for each beam, in order to allow a very accurate estimation of target position in height and azimuth.



KRONOS® POWER SHIELD LAND

L-Band Digital AESA Anti-TBM Radar

KRONOS® Power Shield is a completely digitised multifunctional radar that employs an AESA Antenna with high gain GaN Tx/Rx modules for detection of at long range of ABT (Air Breathing Targets) and medium range ballistic missiles.

KRONOS® Power Shield can operate as a rotating radar, at 15 RPM or in fixed stare mode aimed to the expected direction of the incoming threat.

KRONOS® Power Shield, while providing support to extended Long Range Air Surveillance and fighter Air Operations, is also able to provide Early Warnings and cue data to SAM (Surface to Air Missile) systems for MRAD (Medium Range Air Defence).

KRONOS® Power Shield main features are :

- Air Breathing Target (ABT) detection up to 500 km in range and 30000 m in height, limited by the SW
- Ballistic Missile detection up to 1500 km
- Elevation coverage up to 90°
- Azimuth steering angle up to 90°
- Scan rate 4 seconds (in rotating mode)
- Track management capability > 1000 targets



KRONOS® GRAND MOBILE HP

3D Multi-functional Mobile Radar

KRONOS® GRAND Mobile HP is the latest product of the KRONOS® multi-functional radar family. It is designed to support air and coastal defence tactical operations using a full Active Electronic Scanning Array (AESA) antenna fitted with thousands of GaN (Gallium Nitride) TRMs improving performances over the previous GaAs technology version. The radar simultaneously performs surveillance, dedicated target tracking for weapon engagement and fire control, and ECCM. It detects and tracks any threat, such as aircrafts, high speed missiles, low level UAVs, hovering helicopters, rockets and artillery. As a mobile system with reduced set up and shut down times, easy transportability and reduced manpower requirements it meets the needs for modern tactical operational scenarios. The radar performances for target detection and tracking make it suitable for integration with Medium Range Air Defence (MRAD) systems against ABT and MRBM (Ballistic Missiles up to 3000 km range), where it can act, at the same time, as Surveillance Radar and Fire Control Radar). As a standalone sensor it can be easily integrated in a surveillance network, contributing to the general Recognized Air Picture (RAP). KRONOS® GRAND Mobile HP can be configured in multiple modes to optimize performances for specific missions. For example in Counter Rocket, Artillery & Mortar (CRAM) mode it will execute simultaneously the Fire Finder function to detect and locate enemy artillery, and Fire Direction function to direct fire from friendly forces, estimating and recording shell impact points.



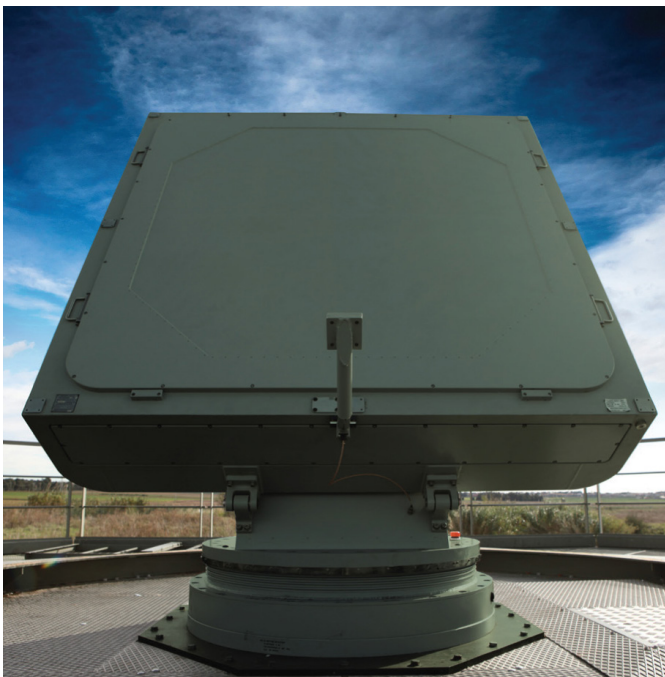
KRONOS® GRAND
3D Multi-function Radar

KRONOS® GRAND is a multi-function radar system designed to support air and coastal defence operations. The system simultaneously performs surveillance, dedicated target tracking and ECCM. It detects and tracks any type of air and maritime threat, such as aircrafts, high speed missiles, low level UAVs, hovering helicopters, rockets and artillery. It is a member of the KRONOS® multi-functional radar family, based on full Active Electronic Scanning Array (AESA) antenna technology. KRONOS® GRAND can be easily integrated into a defence surveillance network, contributing to the general Recognized Air Picture (RAP). When employed in a fixed site Leonardo can perform the necessary studies for site location and defence architecture planning, in order to optimise the system performances (e.g. against low flying, pop-up and highly maneuvering targets) and overall national/operational Air Surveillance effectiveness. Leonardo can also provide infrastructure design and development, including towers, buildings, services, power and communications subsystems.

KRONOS® LAND
3-D Multi-function Mobile Radar

KRONOS® LAND is a multi-function mobile 3D C-Band radar that employs an Active Electronically Scanned Antenna (AESA), hosted in a full standard 20-ft ISO container equipped with autonomous power supplying, temperature conditioning, loading and unloading means for high mobility. KRONOS® LAND successfully accomplishes coastal surveillance, point defence, gap filling and co-ordination of SAM systems. KRONOS® LAND automatically schedules and performs the activity classified as priority according to the tactical scenario by scanning the beam both in azimuth and elevation while mechanically rotating in azimuth at 60rpm.

- KRONOS® LAND main features:
- Air and surface surveillance up to 250km in range and 30 km in height
 - Air and surface tracking (500 tracks):
 - Dedicated tracking for at least 20 30 tracks with high data rate (1s) to reduce reaction time and engage time against small and low visible targets
 - Interceptor guidance data for weapon systems
 - Deployment and tear down time of less than 15 minutes
 - Counter Rocket, Artillery & Mortar (C-RAM) capabilities



TMMR

Tactical Multi-Mission Radar

The TMMR is an air and surface surveillance radar system operating in C-band designed to support homeland protection and battlefield operations. It is a full AESA antenna radar capable to operate in the most disparate environments. The TMMR is a SW defined digital radar that can support a large variety of missions. The TMMR antenna consists of a water proof, dust proof sealed box with no physical moving parts (passive air cooling is used), using GaN high efficiency modules for extremely high reliability and survivability. It can be configured with 1 and up to 4 fixed antennas. Missions supported include:

- C-UAS (Unmanned Aerial Systems)
- Border Surveillance (on ground and water)
- Force Protection and Battlefield Surveillance
- Vehicles Protection
- Air Surveillance
- Integration with V-SHORAD (Very Short Range Air Defence) systems
- Land Patrolling

Reference performances are:

- Air target detection up to 40 km in range and 7000m in altitude
- Micro UAV detection beyond 7 km in range
- Elevation coverage up to 90°
- Weight < 50 kg (transportable by handles)
- Power required < 550W



AULOS®

Passive Covert Radar

AULOS® is the passive radar system to provide detection and tracking capability for defence and homeland security applications. The system works by processing reflections from illumination sources such as commercial broadcast and communications signals. AULOS is an eco-friendly system since it doesn't produce electromagnetic pollution. Passive radar systems are unique because they do not have their own transmitters but exploit the electronic waves already produced by existing sources e.g., FM radio signals, telecommunication equipment. Passive radar systems are often referred as Passive Covert Radar (PCR) and, as a covert radar, the system is ideal for military applications. A passive radar is not detectable by Anti Radiation Missile (ARM) and not easily disturbed by jammers. Since it exploits low frequencies, it can be successfully used to detect and track small targets flying at low altitude in urban areas and even in difficult orographic conditions. AULOS® is a technologically advanced system, developed on the basis of a software defined radar approach. This involves signal sampling directly at the carrier frequency using COTS devices for signal reception and digital processing MultiCore and GPU technologies powered personal computer. AULOS® has proven to be highly effective for maritime surveillance in coastal areas characterized by cliffs and reliefs, and more in general for detecting surface targets. In its deployable configuration, AULOS® has two receiving systems connected to two Uniform Circular Arrays (UCA), each with eight dipole elements, one array operating in the FM band and the other one in the DVB-T band. Each receiving system contains eight coherent receiving channels connected to the array dipoles.



TPS-732

2D Coastal Radar

The TPS 732 is an evolution of the Argos 30VS coastal radar. It is a fully coherent X-band primary radar for combined surface and low level air surveillance of sensitive zones of coastal environment and for Exclusive Economic Zone protection. The selection of the most appropriate technique from those available is based both on an extensive geographical and adaptive mapping system. The TPS 732 can be easily integrated within a coastal surveillance system network. The TPS 732 can be completely controlled from a remote position, allowing the radar site to operate unmanned. The TPS 732 can be provided in multiple versions, configured with different antennas, according to operational performances requirements. When matched to the high gain composite parabolic antenna (TPS 732 V5, see the picture) it can reach detection ranges in excess of 200 DM.

The radar can be sheltered (ISO standard) for truck transport. The radar supports three operational roles:
Mode 1-Long-range range surveillance (surface and air surveillance of small air/surface targets)
Mode 2-Medium range surveillance, characterised by high rotation speed
Mode 3-Over-The-Horizon (OTH), low rotation speed.



PAR 2090C

Precision Approach Radar

The PAR 2090C Precision Approach Radar system is a fully coherent radar operating in the frequency band assigned by ICAO for this type of equipment. This radar provides the ground controller with all information required to guide one or more aircraft during the landing phase up to the touch down in critical weather conditions.

It comprises two main subsystems: the Radar Head Subsystem and the Presentation Subsystem. The Presentation Subsystem can be housed in a dedicated building or shelter as well as in the control tower. As standard provision, the PAR also includes a set of frangible reference corner reflectors for two approach directions.

Each set consists of five passive reflectors. The PAR 2090C can be provided with an external Power Supply to sustain operational tasks in case of power supply interruption as well as to filter and stabilize the incoming power supply.

The Cassegrain parabolic antennas are installed on a platform which can be rotated over $\pm 180^\circ$ to orient the antennas in accordance with the landing directions to be served (at the moment up to eight landing directions can be programmed).

The antenna scanning is mechanical. During the installation phase the platform is lifted to the final position by the motor driven movable central arm (Lifter). The arm permits also the placement of the platform to a convenient height for the installation/maintenance of both antennas. PAR 2090C is available in two models:

- PAR 2090CF (Fixed) sheltered and easily transportable by truck
- PAR 2090CM (Mobile) compact, rapidly deployable and transportable onboard of C-130.

Installation of the PAR 2090CF can be completed in one day by four persons, provided that all required civil works have been completed.



ATCR-33S NG

S-Band Primary Surveillance Radar

The ATCR-33S NG (New Generation) provides en-route and terminal management area services. It is an S-band air traffic control radar.

The ATCR-33S NG is a new added version in the Leonardo ATCR radar family, following a 70 years long radar development history. It integrates the latest radar technologies, including the use of GaN (Gallium Nitride) semiconductor components, in an always more reliable and robust system.

The ATCR-33S NG is designed to be compliant with the international standards for ATC sensors.

Functional and performance characteristics meet the requirements issued by ICAO and EUROCONTROL.

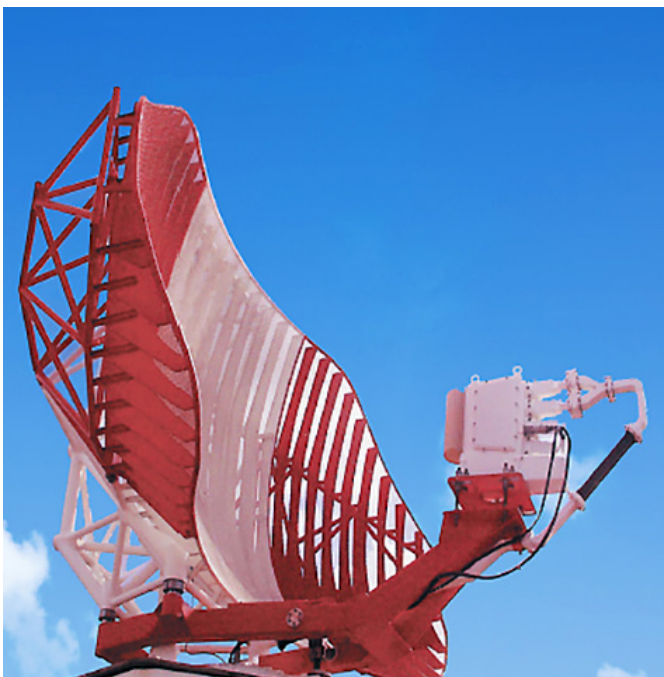
It is a fully redundant system, with the two separate and independent receiving channels included within a single cabinet, capable to be adapted to the most critical installation requirements.

The ATCR 33S NG is also available in a transportable configuration for easy deployment in operational areas (civil and military airports dual use).

ATCR-44S BLOCK 2

L-Band Primary Surveillance Radar

The ATCR-44S BLOCK 2 (New Generation) is the new Leonardo L-band Primary Radar, designed for the detection of cooperative aircraft, suited for Long Range and En-route Air Traffic Control. ATCR-44S BLOCK 2 provides superior surveillance on extended en-route applications with an instrumental range up to 260NM. Compliant with the international standards for Primary Surveillance Radar (PSR) systems, the ATCR-44S BLOCK 2 meets the requirements issued by ICAO and EUROCONTROL in terms of functional and performance characteristics. The TX Control Logic, using high performing solid state GaN technology integrated with an Intelligent Power Management (IPM), provides the desired output level by enabling/disabling output ports in each module. Monitor and control activities can be performed from local or remote stations with user-friendly operator's interface. High operational flexibility and system availability are also guaranteed through cutting edge technological choices.



RAT-31 DL/ATC

L-Band 3D Primary Surveillance radar

The RAT-31 DL/ATC is an advanced L-band solid state 3D radar with AESA antenna, dedicated to the modern Air Traffic Control mission to provide security also in presence of unexpected threats. It is a dual use radar, derived by the military RAT-31 DL digital version, using the same physical and data processing architecture with a reduced number of radiating rows, each one fed by a Digital-TRM, in GaN technology, with a full band AD conversion.

The RAT-31 DL/ATC detection performances are maintained in a broad spectrum of scenarios, including those with “non-cooperative” targets, and where ECM can be used in presence of heavy clutter, in particular from rain and turbines.

The radar uses multiple simultaneous independent pencil beams, which provide monopulse altitude measurements with excellent accuracy and discrimination, even with frequency agility modes. The RAT-31 DL/ATC modular and redundant design allows for military grade performances coupled with the reliability required for ATC operations, still keeping a very low cost/effectiveness ratio. With more than 20000h of MTBCF ensuring long term 24h/7days operations it also allows for on the run maintenance, resulting in very high system availability.

SIR-S/I AND SIR-M

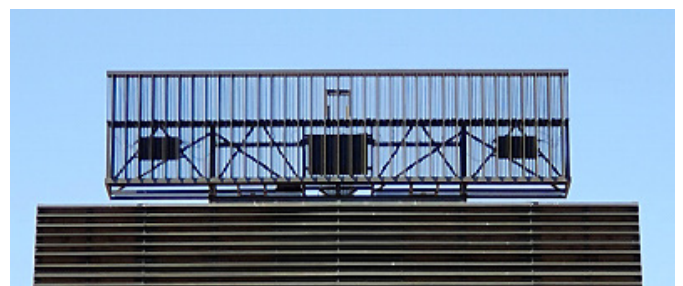
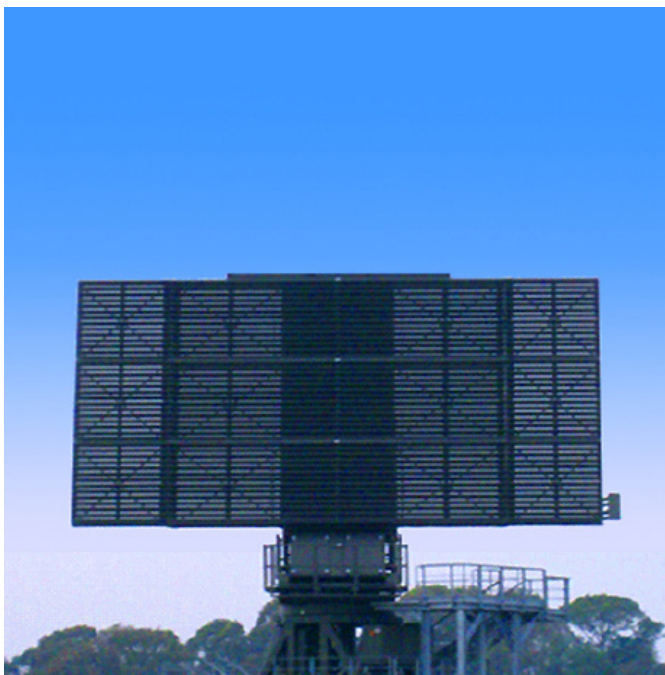
Secondary Surveillance Radar

The SIR-S/I (for civilian use) and SIR-M (for military use) Secondary Surveillance Radars are modular systems fully compliant with ICAO and EUROCONTROL recommendations on Mode-S operation.

SIR-S/I can operate in SSR Conventional Modes (1, 2, 3/A, C), Mode S Elementary and Enhanced Surveillance up to full Extended data link operation employing level 5 transponders. It is equipped with a dedicated ADS-B receiving channel and processing chain in order to acquire, decode and process 1090MHz Extended Squitter messages from Omni and Sum MSSR antenna channels.

SIR-M adds the IFF military capability through the implementation of Mode 4 and 5 (up to level 2).

All the crypto components and equipment are produced by Leonardo, allowing for quick adaptation to standard future evolution and to customer specific requirements.





KRONOS® DBR

Fixed panels multifunctional Dual Band Radar

Fixed panels multifunctional dual band radar KRONOS® DBR is designed to fulfill the most demanding missions for world-class Navies. Antennas' designs are based on the extensive experience in developing Multifunctional AESA radar systems. All radar components are fully solid-state, offering unrivalled detection performance and high reliability of the overall mission system with a modular and scalable radar architecture. KRONOS® DBR represents the most advanced solutions exploiting in a synergic way both a C-Band sensor and an X-Band sensor. The two sensors are managed by a unique and central intelligence, the System Manager, which optimizes the use of sensors, time and frequency in an extremely flexible way to adapt the KRONOS® DBR processing to the operative scenario

Superior performance for the following missions:

- Local Area and Self Defence
- Air & Sea Surveillance
- Ship Self Defence
- Naval Area Defence
- BMD Defence (TBM 600 autonomous, 1300 designated)
- Gunfire Support
- Active Missile Guidance (Uplink)
- Firing direction (back up to FCS)
- Electronic Attack with EW

The System Manager ensures that the overall performances of the entire system will be greater than the sum of the single radar components providing coordination and optimization of the time budget on each face guaranteeing both azimuth and elevation coverage and real time allocation of the time/energy budget to the different activities (search, tracking, auxiliary).

KRONOS® DBR performs simultaneously and independently by scanning the beam both in azimuth and in elevation:

- Surveillance up to 300km
- Tracking up to 90° in elevation
- Firing
- ECCM



KRONOS® QUAD

Fixed panels multifunctional C band radar

KRONOS® QUAD is composed of fully solid state multichannel GaN technology fixed faces active electronically scanned array (AESA) antennas designed to perform ABT TBM defense combined with multiple target fire control capability.

Designed with the same architecture of the KRONOS® DBR, QUAD has a System Manager which perform a full integration of four independent sensors to optimize both surveillance and tracking performances by allocating the radar task to the optimum sensor.

KRONOS® QUAD is the main assets for the integration in SAM systems supporting the active missile guidance by exploiting the outstanding track accuracy and the refresh rate.

KRONOS® QUAD successfully accomplishes the following main missions:

Air & Sea Surveillance and Tracking against all types of targets up to 300km

Point Defence, Local Area Defence and FCS in a SAM system against Air Breathing Target, including:

- Guidance of active missiles (thanks to the capability of tracking not only the dangerous threats but also the own missiles)
- Uplink function for Own Missile guidance

BMD Defence against short range TBM 80/300/600:

KRONOS® QUAD is the multiple fire control radar of BMD (Ballistic Missile Defence) systems against short range TBM during their re-entry phase

Contribution to the BMD mission to counter TBM threats is possible:

- On cueing ATBM: TBM track initialization and tracking starting from 3D external cueing. This function is provided in all operative modes

- Autonomous ATBM (without cueing): TBM detection, track initialization and tracking in autonomous way.

Gun Fire Support: supporting the gun fire providing a dedicated surface task with a renewal time of 1s to improve detection & resolution capability (i.e., Splash Spotting) on a sector or on a specific track.



KRONOS® STAR FIRE

Fixed panels multifunctional X band radar

KRONOS® STARFIRE is based on fully solid state multichannel technology fixed faces active electronically scanned array (AESA) antennas designed to perform ABT defense combined with multiple target fire control capability and superior surface surveillance performances.

Gun Fire Support: KRONOS® STARFIRE supports the gun fire providing a dedicated Surface task with a renewal time of 1s to improve detection & resolution capability on a sector or on a specific track.

KRONOS® STARFIRE successfully accomplishes the following main missions:

Air & Sea/Surface Surveillance and Tracking against all types of targets up to 200km

Point Defence and Coordination of SAM system against Air Breathing Target, including:

- Guidance of active missiles
- Coordination of FCS with different semi-active missiles
- Gun Fire Support: supporting the gun fire providing a dedicated surface task with a renewal time of 1s to improve detection & resolution capability (i.e., Splash Spotting) on a sector or on a specific track.

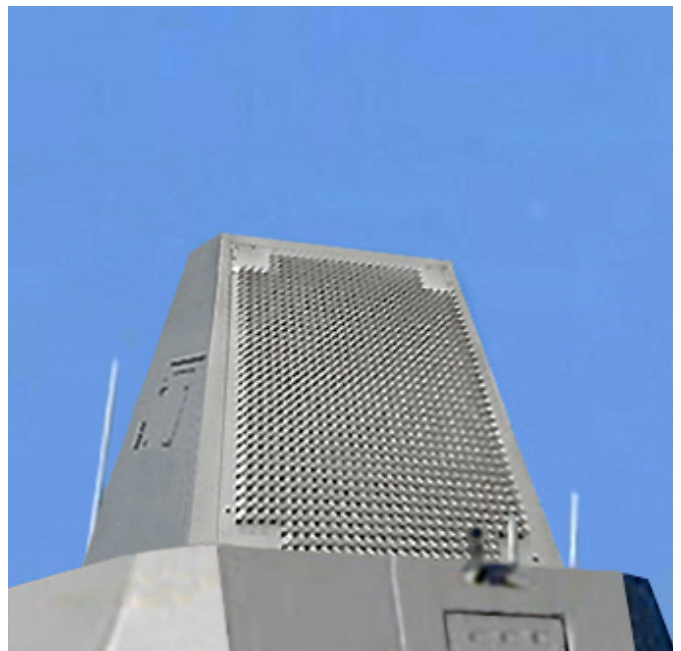
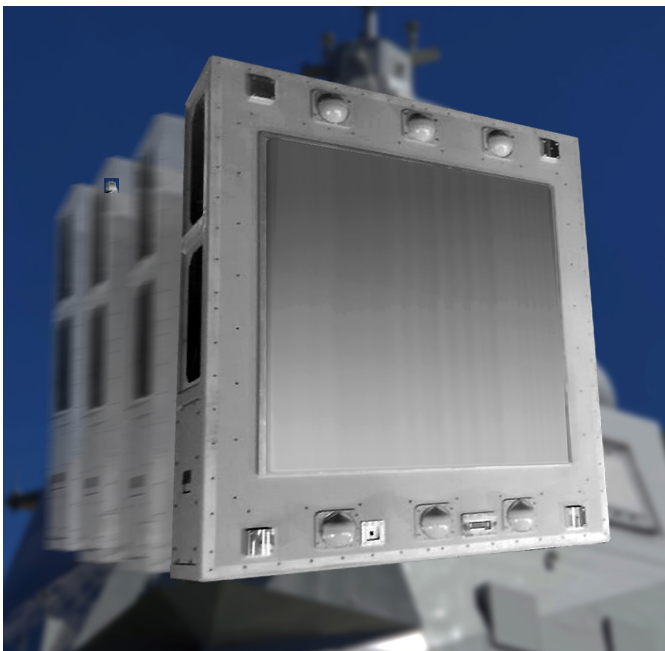
KRONOS® POWER SHIELD

Multifunctional Early Warning Radar for Ballistic Missile Defence

KRONOS® Power Shield is a Fully Digital Multifunctional L band Radar for Early Warning, Aviation support, TBM Surveillance and defense equipped with a Fully Digital Active Electronic Scanning Antenna (AESA FD).

Rotating and stare mode operation. Real time selection of the radar waveforms and frequencies to perform at best each radar mission against each threat thanks to Digital waveform generation/ RF sampling and fiber optic data link to DBF based on individual TRM output processing. Superior performances in performing the following missions:

- Air & Sea Surveillance and Tracking against various types of threats, including high manoeuvrability, small cross section, low altitude targets up to 500km
- TBM Surveillance up to 1500km against Tactical Ballistic Missiles in ascending phase providing the surveillance of a very extended area sending Track Data to an higher level Command and Control Entity for a mission of BMD Tactical Picture Updating
- TBM Defence against Tactical Ballistic Missiles in descending phase providing a cue to an external Fire Control Radar/CDS in a point/area defence mission.



KRONOS® GRAND NAVAL

Naval Multi-function Active Radar

KRONOS® GRAND NAVAL is a multifunction radar, based on advanced Active Electronically Scanned Array (AESA) technology, used as main radar for the Principal Anti Air Missile System. KRONOS® GRAND NAVAL applications include extended self-defence, air and sea surveillance and tracking, volumetric search and multiple missiles guidance.

KRONOS® GRAND NAVAL is the most advanced multimission naval radar world-wide, validated by various trials on the FREMM class vessels.

It is a real multi-function radar designed to enable warships, such as frigates and destroyers, to perform naval war fighting missions such as extended self-defence and area protection, in complex scenarios against multiple attacks in very severe (clutter and jammer) environments.

Being fully solid-state and with redundancies for all equipments, it offers an unrivalled high availability.

KRONOS® GRAND NAVAL uses its multi-function capability to simultaneously and independently perform surveillance and targets tracking by electronically scanning the beam both in azimuth and elevation, in addition to mechanical rotation.

The system offers high-performance ECCM features.

KRONOS® GRAND NAVAL exploits a high data rate to reduce reaction time and engage time against small and high manoeuvring targets. 3D air surveillance extends to 300km and up to 70° in elevation.

KRONOS® NAVAL HP

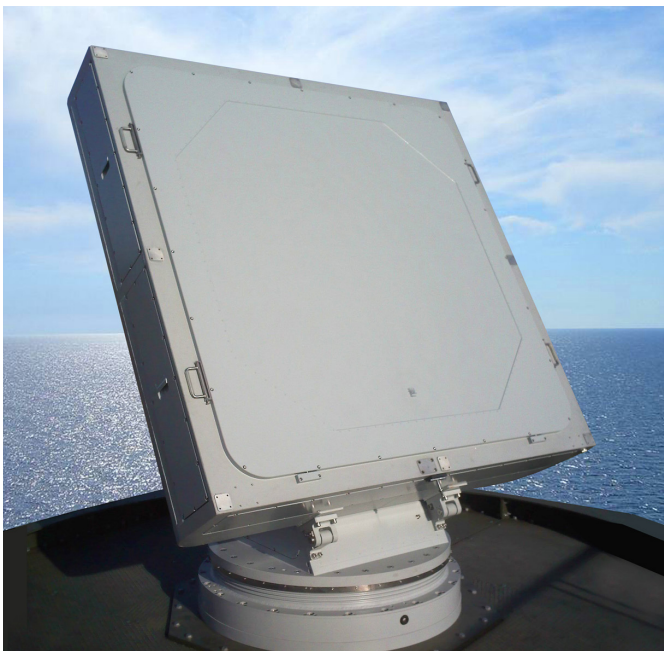
Naval Multi-function Active Radar

KRONOS® Naval HP is a multi-function C Band radar based on advanced Active Electronically Scanned Array (AESA) technology, used on naval vessels of 400 gross tons and above. KRONOS Naval HP applications include point defence, air and sea surveillance, littoral warfare, missile and gunfire support.

KRONOS® Naval HP is designed for small and medium warships, such as corvettes and offshore patrol vessels performing naval missions such as point defence, patrolling and land forces assistance.

Suitable for a wide range of vessels, KRONOS® Naval HP performs the following main tasks:

- Air and surface surveillance up to 250km, with elevation coverage of up to 70° to help counter high diving missile threats
- Priority evaluation of threats
- Air and surface dedicated tracking with different refresh rates depending on the danger of the threat
- Dedicated tracking for active missile guidance (e.g., VLMICA, ASTER)
- Dedicated tracking against small and low visible target or pop-up targets, such as Sea Skimmers
- Target designation to weapon systems
- Gunfire support/splash spotting
- The radar coverage is obtained by phase scanning both in azimuth and elevation while the system mechanically rotates at 60rpm. KRONOS® Naval HP is a multi-mission system, which can fully integrated in any type of combat management system.



SPS-732

2D LPI Surveillance Radar Family Air Missile System

The SPS-732 is an X-Band Low Probability of Intercept (LPI) multi-function Doppler radar. It is suitable for surface situation awareness and air surveillance at low level.

The IMO compliant radar is designed to provide excellent detection features combined with silent mission capability, and also navigation assistance and helicopter control in all weather conditions.

The SPS-732 utilizes proprietary state-of-the-art coded pulse LPI techniques. It uses an advanced digital receiver and waveform generator to allow simultaneous long range detection and minimum range coverage. Doppler modes for low false alarm air target detection are implemented through fully coherent radar features.

Key features

- Multi-Mode Radar: Surface, air and combined surveillance optimized modes with Very High resolutions
- LPI pulsed radar, featuring easy interface with on board ESM
- Very low power solid-state transmitter with power management adaptive to operational environment
- Fully coherent architecture, with high dynamic Doppler (MTI) processing
- Lightweight high gain antenna fully stabilized reflector antenna with cosec² pattern
- Digital compressed pulses with proprietary, digitally generated complex waveforms
- No close range blind zones
- Range scale up to ~100nmi for Over the Horizon detection
- Frequency agility, PRF Jittered
- High resistance to ECM
- Interferences processing elimination to manage High electromagnetic density environment.

SPN-720

LPI Shipborne Precision Approach Radar

SPN-720 is a Solid-state, Low Probability of Intercept (LPI) naval Precision Approach Radar. Its compact dimension (around 1 cubic meter) allow easy installation on any Ship and stand it as candidate for the smallest PAR in the world.

The radar is able to provide safe and reliable final approach and deck landing guidance for aircraft during day/night and in adverse weather conditions.

The SPN-720 offers CV NATOP Mode III landing, manual approach, ICAO compliant during which the radar controller relays continuous updates to the pilot on his position and direction via a secure VHF Channel.

The SPN-720 employs an I-band Doppler radar with coherent solid-state transceiver, utilizing frequency agile monopulse tracking with operating range from 60 m up to 12 nautical miles.

The SPN-720 is capable of automatically correcting the parallax error between the radar location and the landing path and can be operated as a stand-alone system or it can be integrated with the ship Combat Management System. The SPN-720 can provide simultaneous control of two aircraft. Its Man-Machine Interface features two consoles each fitted with the PAR Display the Air Search Display. The two consoles can operate in master/slave mode or dedicated to the assistance of one of the two simultaneous landing aircraft.



NA-25X

Fire Control System

NA-25X is a Fire Control System (FCS) able to control medium calibre guns in the anti-air and anti-surface warfare roles as well as small calibre guns in the CIWS role. Up to three guns of different calibres can be controlled by its computer unit.

NA-25X is a modern Fire Control System (FCS) based on the ORION RTN-25X tracking naval radar, a J-band fully coherent equipment which is characterised by anti-nodding, extensive ECCM and anti-clutter features together with high tracking accuracy.

A set of two EO sensors (TV camera, IR camera) can be mounted on the radar director, to enable firing assessment and to provide an alternative line-of-sight on the same target. A third sensor (Laser Range Finder) can be mounted to provide a complete EO tracker facility.

NA-30S

Fire Control System

NA-30S is an advanced modular weapon control system designed to control surface-to-air missile system and guns (up to three gun outputs) in a sophisticated threat environment and in coordinated fire reaction mode. NA-30S is a modern Fire Control System (FCS) based on the ORION RTN-30X tracking naval radar, a I-band fully coherent equipment which is characterised by antinodding, extensive ECCM and anti-clutter features together with high tracking accuracy.

A set of two EO sensors (TV camera, IR camera) can be mounted on the radar director to enable firing assessment and to provide an alternative line-of-sight on the same target. A third sensor (Laser Range Finder) can be mounted to provide a complete EO tracker facility. NA-30S interfaces the CW Illuminator Transmitter and supports the engagement against a target, conducted through the deployment of the ESSM (Evolved Sea Sparrow Missile), by illuminating the target itself.

A couple of Targets Designation Sight (TDS) enhance the FCS configuration. Through an internal additional function, NA30S system can be integrated inside an Artillery System (including at least two FCSs), to optimize the use of all onboard guns against multiple concurrent targets (missiles, air and surface targets).



NA-30S MK2

Multi-Sensor Fire Control System

NA-30S MK2 is a new generation Weapon Control System designed to control modern guns (up to five) against conventional and asymmetric air/surface threats with a reduced reaction time.

NA-30S MK2 is based on a dual-band (X and Ka) naval tracking radar with a stealth antenna design which combines high tracking accuracies with improved range performance. Both X and Ka bands are processed in order to optimise tracking performance according to the targets.

The Weapon Control System automatically selects the optimum ammunition and firing patterns according to the tracked threats. A set of combined sensors (TV camera, IR cameras and laser) can be mounted on the radar antenna to enable firing assessment and to provide either an alternative or redundant line-of-sight.

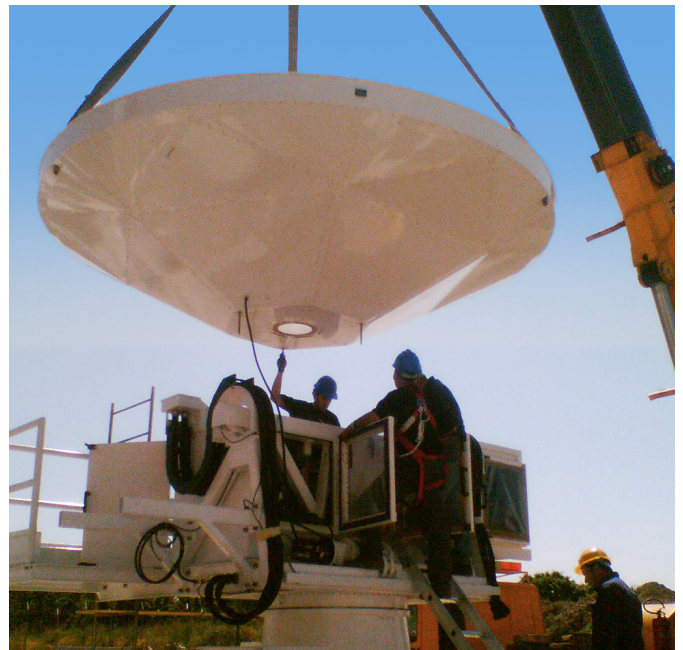
Main operational functions

- Dual-band radar and optronic tracking
- Gun fire control with automatic coordination of different weapons
- Automatic engagement of evaluated priority target up to firing action
- Over-The-Horizon tracking features
- Reduced reaction times to allow detection, tracking and against sea skimmer/high diving supersonic missiles and asymmetric threats
- DART ammunition guidance provided with CWI illumination for semi-active missile guidance, HRRP and panoramic surveillance features.

SUPPORT TO SYSTEMS AND CAPABILITIES

Systems developed by the company are high value assets, created with the promise of an effective operational life-cycle. To guarantee total customer satisfaction, after-sales support services are carefully engineered to ensure high levels of systems performance. We have dedicated department which consists of specialists, along with a network of value-adding partnerships with support related companies, in order to provide the best after-sales support to its valued customers. The service concept offers a cost-effective, flexible solution which is capable of adapting and adjusting the support content and levels of support, in order to meet the evolving needs of the customer. The company provides customers with Contractor Logistics Support (CLS) type contracts, which specify the after sales support services and level of service requirements through formalized Service Level Agreements (SLA). The customer support department is geared to provide support services to any type of system, from basic low-level operating systems to large complex systems. The Customer Support Service Desk (CSSD) represents the Single Point of Contact (SPOC) with the company (Customer Support) for the customer. The Customer Support Service Desk is a multi-channel medium designed to ease communication (telephone, fax, e-mail, Web Portal). Customer Support services can be customized in order to meet the specific requirements of the customer whilst delivering the best value for money. Additional service components may be added in accordance with specific support requirements. Key support service delivery includes:

- Configuration Management Services
- Engineering Services
- Field Engineering Services
- Material Management Services.



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