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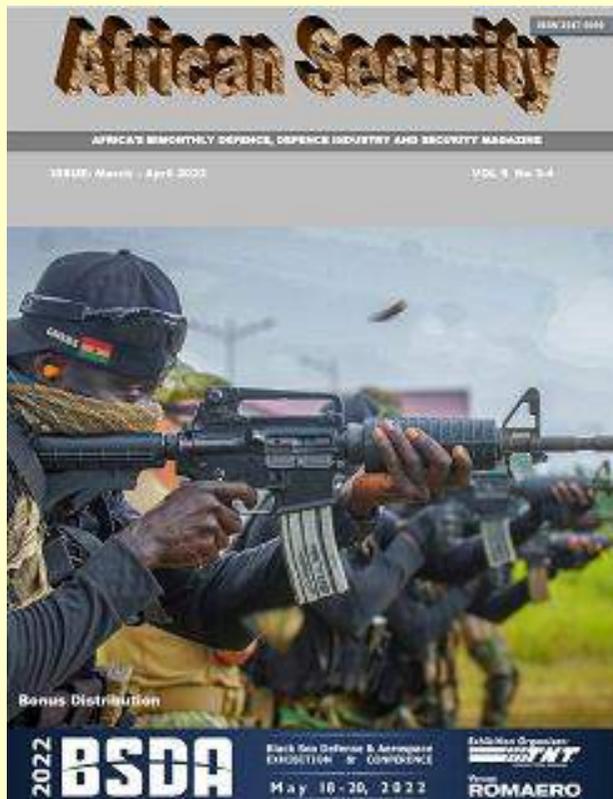
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Patrol Boats Enhancing Maritime Security in Africa

A patrol boat is a relatively small naval vessel generally designed for coastal defence, border protection, immigration law-enforcement, search and rescue duties. There have been many designs for patrol boats. They may be operated by a nation's navy, coast guard, police force or customs. They are commonly found engaged in various border protection roles, including anti-smuggling, anti-piracy, fisheries patrols, and immigration law enforcement. They are also often called upon to participate in rescue operations.

They may be broadly classified as inshore patrol vessels (IPVs) and offshore patrol vessels (OPVs). They are warships typically smaller in size than a corvette and can include fast attack craft, torpedo boats and missile boats, although some are as large as a frigate.

The offshore patrol vessels are usually the smallest ship in a navy's fleet that is large and seaworthy enough to patrol offshore in the open ocean. Smaller inshore patrol vessels also known as coastal patrol craft or coastal patrol boats. Riverine patrol craft are used for patrol river area. In larger militaries, such as in the United States military, offshore patrol vessels usually serve in the coast guard, but many smaller nations' navies operate these types of ships.

The global impact of piracy on the world is growing as the economic and social struggle turn to extreme measures to feed their families and make a stand against the vast wealth that is being gained from the oil and other resources in these seas. Also, the impact of Illegal, Unreported and Unregulated fishing (IUU) is uncontrolled leading to fears that this will largely affect the African economy and populations on the coastline that are dependent on the fish food. The current economic situation in Africa restricts individual states from being able to effectively tackle the problem. Unclear definitions over territorial laws and a lack of better coordination between African nations has enabled piracy to escalate with ambiguities and ways to avoid conviction or capture.

Maritime security operations entail routine patrols to determine pattern of life in the maritime domain, enhance mariner-to-mariner relations and disrupt the transport of illicit cargo. Through persistent maritime security operations, coastal nations show its commitment to enabling the free flow of commerce for legitimate traffic as well as to contest the battle space in all areas where the transport of illicit cargo is used to fund and/or arm terrorism and other unlawful activities is paramount.

The piracy problem in East and West Africa received global attention in 2007 and stimulated interest in African maritime security challenges. Following a dramatic increase in the number of hijackings, international and regional actors established a large and focused framework for c. The current shipbuilding market ask for a fast patrol able to enhance maritime security in the African continent and to combat piracy, illegal fishing, human and drugs trafficking.

© NVL- OPV 41





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THE DNA OF SHIPBUILDING



© Israel Shipyards / SHALDAG _MK V

Around the world, patrol boats are critical assets for providing coastal security and surveillance. The coastal patrol boats are designed to enhance maritime surveillance capabilities of the naval forces. In addition to supporting private security efforts, many different types of patrol boats are used within the government and military programs of nearly every nation.

The challenges for the design of reliable patrol boats consist in developing an optimized hull form and integrating state of the art vessel components such as propulsion, power units, and mission equipment in order to offer a highly efficient and flexible platform, improving operability at sea. Patrol vessel designs are answering the operational requirements of surveillance and protection missions.

Large endurance with fuel efficiency, good seakeeping performances by high speed and high sea states, flexibility of the lay-out allowing integrating fast ribs and, autonomous marine vehicles efficient integration of weapon, communication and surveillance systems are the

key features of various designs. International shipbuilders can provide many different solutions with tailor-made characteristics for you to protect strategic places. Considering that client's main asset is the crew, authors designers pay special attention to the crew comfort and safety by delivering ergonomic lay-out design and high-quality accommodation and mission facilities.

- The patrol boat can be operated and controlled from a flying bridge with large windows, offering a wide-angle view of the horizon on all sides.
- A small caliber canon can be fitted on the fore deck can be fired against speed boats, helicopters and small aircrafts. The patrol boat should be armed with 12.7mm machine guns for defence against lightly armoured targets.
- Naval vessels rely on their human crew to deliver the operational capability. For anti-piracy, security and naval vessels Command & Control (C2) is one of the most important functions that needs to be supported and facilitated by the vessels design.

EMPOWERING YOUR NAVAL PERFORMANCE



FORESEEING YOUR NAVAL NEEDS

- The onboard HF and VHF radio equipment provides communication over short and long distances, while a stabilized video camera with a laser spotlight is used to detect and identify possible or confirmed targets.
- The boat should be equipped with high-definition marine radar, antenna mast, and searchlights atop of the surveillance bridge.
- Patrol boat can sail at high speeds and operate over a distance of 1,500nm, when sailing at a speed of 15kt. The hull should be designed to offer high sea-keeping performance.
- The boat should have the ability to endure for seven days without refueling. It should incorporate two electric generators systems and can be offered with two fixed-pitch propellers or waterjets.

International Shipbuilders R&D teams are continuously improving its patrol vessels – making them faster, quieter, more economical and more environmentally friendly. Designed for ultra-high-speed patrol duties in all waters interceptors patrol boats can outpace most other vessels. From maximizing operations and lowering risk to reducing operational costs. It's clear and obvious that patrol vessel operations can benefit greatly from autonomous vessel technology as well.

NVL (former Lürssen) fast patrol boats, quick and versatile, offering top speeds of over 40 knots, these fast patrol boats can respond to challenges quickly. With high performance and excellent seakeeping characteristics, these units are ideally suited to, securing and patrolling coastal waters, deployment in emergency and disaster situations and local naval operations in territorial waters. Suited to your needs, the basic design can be easily adapted to suit your littoral or confined and shallow waters environment and handle specific challenges, such as rapid interception of smugglers, pirates or rogue fishing vessels.

One of the Israel Shipyards Ltd vessels currently in highest demand, the SHALDAG FPC is most valued for security tasks where high intercept speeds and easy maneuverability are required. In addition, the vessel is equipped with highly advanced weapons systems, produced by world-recognized Israeli designers. The combat-proven success of this unique ISL craft was quickly established with the Israeli Navy, attracting the attention of many other Naval forces.

Drawing on extensive operational experience in different environments, the craft continued to be improved, including the addition of newer lightweight weapons systems.

The Dutch shipbuilding firm The Damen Group, designs and manufactures a wide variety of vessels, including a range of related patrol vessels known

generally as the Damen Stan Patrol Vessels. The Damen Stan patrol vessel designs' names include a four-digit code, where the first two digits are the vessel's length, in metres, and the second two digits are its width. Over a dozen nations have classes of vessels based on the Damen Stan 4207 patrol vessel design.

To ensure coercive intervention the OCEA range of interceptors offers very high-speed capabilities, while keeping full maneuverability, Reduced heeling while fast turning, Optimal response in rough sea, Optimized tactical diameter, Short crash stop distance. The excellent sea keeping performances and high stability of these very fast boats enable the use in maneuver at full speed of gyro-stabilized guns. Moreover, the C-HERON and the C-SWORD are designed to receive surface to air and surface-to-surface fire and forget missiles.

Benefiting from navies' operational feedback and KERSHIP's expertise in shipbuilding and system integration, the CPV 32 is KERSHIP's answer to perform law enforcement operations at sea with high speed, fast intervention capabilities, significant versatility, endurance and sea-keeping behaviour. The CPV 32 is a compact and cost-effective patrol vessel that can be equipped with the necessary communication and armament system. A close attention has been given to high reliability and maintainability due to KERSHIP's extensive experience in Through Life Support.

Swiftships has built around 30 boats for the Egyptian Navy including mine hunters, survey vessels, and both steel and aluminum patrol boats. Swiftships' 28 Meter Patrol Boat is designed for multiple roles, including coastal defense, anti-surface operations, Maritime Security Operations (MSO) and Maritime Interdiction Operations (MIO), surveillance and intelligence gathering, search and rescue, etc. Swiftships BOT (Build, Operate & Transfer) approach secured complete Transferred of Technology (ToT) and Transfer of Production (ToP) to Egypt.

Recent Patrol Boat Deliveries in African Navies

■ Egypt Navy

In early 2021, Egypt took delivery of more Lürssen patrol boats. Lürssen has delivered a second batch of patrol boats to Egypt Navy by the heavy-lift ship Rolldock Sunas, as part of an order for ten vessels, carrying a 60-metre patrol boat bearing the pennant 710 and two 40 metre OPB 41 (previously marketed as the CSB 40) coastal patrol craft bearing the pennant numbers 705 and 706. The first batch of four 40 metre hulls (701-704) was transported to Egypt in 2020. <https://www.egyptdefenceexpo.com>

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In November 2020 it emerged that Egypt would be receiving nine Lurssen patrol boats and a single coastal defence boat from Germany under a 130 million euro deal after the contract with the original customer, Saudi Arabia, fell through.

● Ghana Navy

The Ghana Navy has received four Offshore Security Vessels at the Takoradi Port as part of activities undertaken in line with the tradition of the Ghana Navy prior to the deployment of vessels. Chief of the Naval Staff (CNS), Rear Admiral Issah Adam Yakubu officially received the vessels from the Vice President of Israel Shipyards Mr Oded Breier on Monday 10 January 2022, following their arrival at the Takoradi port on Saturday, 8 January 2022. In his address, the CNS said the acquisition of the vessels was part of Government's decision to discontinue the deployment of Armed Security Guards on civilian vessels to provide the needed security to International Oil Companies operating in the country.

● SA Navy



© Damen

On 25 March 2021, Damen Shipyards Cape Town (DSCT) launched the first of three Multi-Mission Inshore Patrol Vessels (MMIPV) procured by ARMSCOR for the South African Navy (SAN). The vessels will augment South Africa's maritime security by enhancing the country's capability to respond effectively, rapidly and cost-effectively to threats such as illegal trafficking and fishing. DSCT Project Manager, Ian Stewart said the launch was an important milestone for the shipyard.

● Ivorian Navy

Vice-Admiral N'GUESSAN KOUAME CELESTIN, Chief of Staff of the Ivorian Navy (CEMMAR), unveiled on Friday 22 April 2022, at the Place d'Armes of the Naval Base, the forthcoming acquisition of a P400 ship, two OPV45s and maritime surveillance drones.



© Marine nationale

The P400 is a class of French Navy patrol boat, built to carry out missions of surveillance and protection of the Exclusive Economic Zone (EEZ), fisheries policing, etc., as part of the State's action at sea.

● Nigerian Navy



© Grup Aresa

In late 2021 Spain's Grup Aresa International have delivered four Aresa 1700 inshore patrol boats to the Nigerian Navy. The Areas 1700 (Fighter II class) is constructed using aluminium and is around 17 metres long. Its overall length is 19.2 metres with a 4-metre beam. Each vessel displaces 7.6 tonnes, powered by two MTU engines each producing 1 250 horsepower and operating a propeller. Maximum speed is much over 40 knots. A RHIB can be also carried onboard and equipped with thermal and night vision cameras.

*Dimitrios Angelopoulos M.Sc.
Captain (Rtd)HN*

Advisor on Defence and Maritime Security issues



BARKAN

AUTONOMOUS POWER ON THE BATTLEFIELD!

BARKAN, which will take a part in the operational areas of the future through remote control and autonomous mission capability, provides close mission support to law enforcement officers. BARKAN can carry out joint operations with other manned or unmanned land and air vehicles from a single-center due to its swarm infrastructure. BARKAN can be used in multi-purpose tasks by means of its superior autonomy features and modular design in which different payloads can be integrated.



BARKAN
R40
ROBOTIC ARM



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S40
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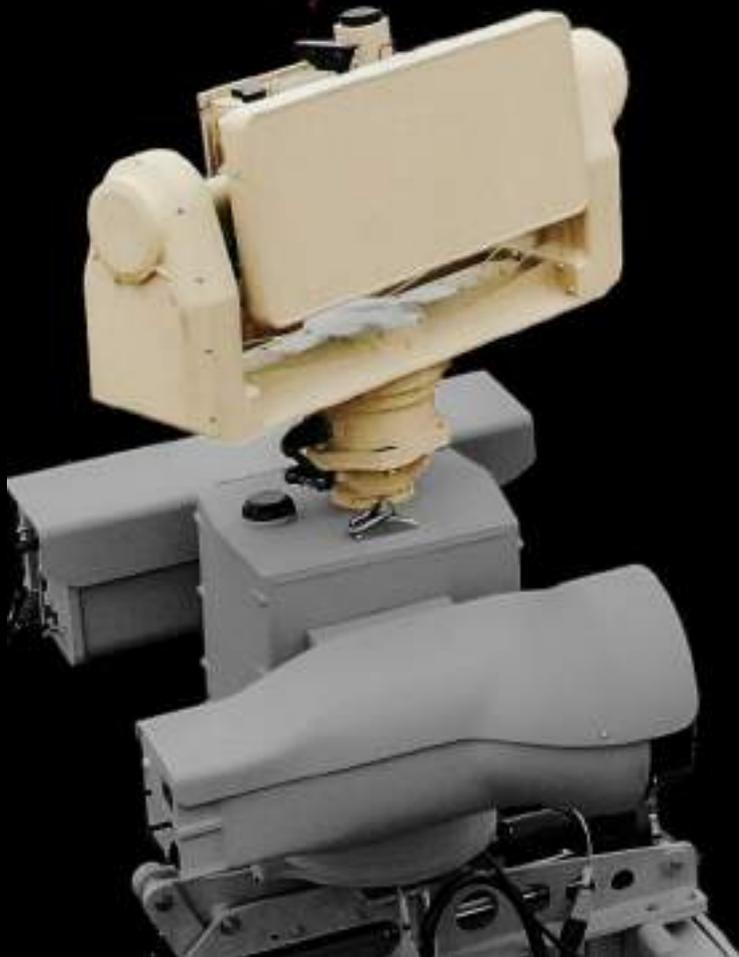
BARKAN
W40
ARMED



BARKAN
C40
CARRIER



SRC Awarded Contract to Deliver Radars to Egypt



The Advanced Technology Systems Company (ATSC) has awarded SRC, Inc. a contract to manufacture and deliver SR Hawk™ ground surveillance radars in support of Egypt's MS3 program. The SR Hawk radar is a long-range ground surveillance radar delivering a unique blend of performance and value. Engineered and designed with the end user in mind, the radar provides highly reliable situational awareness in a low-power package that is easy to setup and use. SRC is continuously improving this system with hardware and software updates that enhance usability and performance.

"We are honored to provide Egypt with the robust and capable SR Hawk radar for their mission," said SRC president and CEO, Kevin Hair. "These radars are helping to keep borders secure and warfighters safe around the world."

The SR Hawk radar operates in all weather conditions and extreme temperatures common in Egypt. The radar offers automated electro-optic sensor cueing, audible alerts, multi-target tracking and anti-clutter techniques, allowing operators to focus on the threat, not the radar. Hundreds of SR Hawk radar systems have been deployed worldwide and are helping to protect warfighters, borders, and critical infrastructure – a testament to the SR Hawk radar's proven performance and reputation around the globe.

SRC, Inc. (@SRCDefense), a not-for-profit research and development company, combines information, science, technology and ingenuity to solve "impossible" problems in the areas of defense, environment and intelligence. Across a family of companies, SRC applies bright minds, fresh thinking and relentless determination to deliver innovative products and services that are redefining possible® for the challenges faced by America and its allies.

Since 1957, SRC's commitment to the customer and the best solution — not the bottom line — has remained a core value that guides its efforts. This passion for quality carries through to the technologies the company invents and manufactures, the laboratories and facilities it builds, the people they hire, and communities where they work. Today, more than 1,500 engineers, scientists and professionals work together at SRC to protect people, the environment and our way of life.

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CESSNA GRAND CARAVAN EX FLEET TO GROW IN AFRICA IN SUPPORT OF TUNISIAN AIR FORCE

On 7 March 2022, Textron Aviation announced it was awarded a contract by ATI Engineering Services, LLC for four Cessna Grand Caravan EX aircraft for the Tunisian Air Force. The Cessna Grand Caravan EX is designed and manufactured by Textron Aviation Inc., a Textron Inc. company

The fleet of Grand Caravan EX single-engine turboprops will aid the Tunisian Air Force in intelligence, surveillance and reconnaissance operations in the country, Bob Gibbs, vice president, Special Mission Sales for Textron Aviation

“The fleet of Grand Caravan EX single-engine turboprops will aid the Tunisian Air Force in intelligence, surveillance and reconnaissance operations in the country,” said Bob Gibbs, vice president, Special Mission Sales for Textron Aviation. “The aircraft is engineered for challenging missions, high payloads and short, unimproved runways, while delivering single-engine economy and simplicity. It is a perfect match for this mission throughout Africa.”

ATI Engineering Services will modify and equip the aircraft with an electro-optical/infra-red sensor, operator console, tactical radio, video data link and night vision compatible lighting. These are the first Cessna Grand Caravan EX aircraft for the Tunisian Air Force. Since 2014, the U.S. Government has provided grant aid funding for 16 Grand Caravan EX aircraft procured through Foreign Military Sale cases throughout Africa, with Tunisia being the latest recipient. U.S. Africa Command (AFRICOM) intent is to field multiple iterations of this configuration throughout Africa, and to streamline logistics support and enhance partner nation interoperability, both of which is expected to reduce costs to the partner nation and to the US Government.

The Cessna Caravan platform has seen more than 2,900 aircraft delivered that are certified in 100 countries with nearly 24 million flight hours amassed worldwide since the aircraft was introduced. Caravans fulfill roles for multiple missions, ranging from flight training to recreation, commuter airlines to VIP transport, cargo carriers and humanitarian missions. The aircraft offers an impressive output of 867 horsepower and a rate of climb of 1,275 feet per minute.



FORCE BEHIND THE FORCES

Our vision is peace and stability. Armed deterrence is a powerful policy to preclude the destructive elements from marring peace, bringing stability and reconciliation ultimately. To combat with valor, we deliver the best defense equipment to support the **armed forces for maintaining peace and stability.**





NVL GROUP SUPPORTING AFRICAN SECURITY

Offshore patrol vessel 80

Effectively protecting African values

NVL Group understands the growing importance of the geostrategic aspects of the African continent in respect of natural resources and protecting the sovereignty, integrity, economy and wealth of the various African nations. The company has a strong reputation and expertise in tailor-made concepts and solutions for coastal defence and maritime security.

Maintaining security

Today's navies face a broad spectrum of challenges in maintaining security in a fast-changing maritime environment. These geostrategic aspects mean that nations require affordable, versatile and fast platforms to operate successfully in territorial waters and to protect against traditional threats. Whether the mission is protecting economic resources, countering criminal activity or safeguarding life at sea,



a flexible and effective response is essential. At NVL Group, we recognise the importance of building vessels that are easy and economical to operate yet still deliver superior levels of performance.

Customise platforms for any naval requirement

NVL Group provides state-of-the-art patrolling solutions for every kind of challenge

and threat, such as patrol boats, offshore patrol vessels, corvettes, frigates, mine-hunters or naval support vessels.

Territorial sea (< 12 nm)

- Offering high speeds of over 40 knots, NVL fast patrol boats can quickly respond to challenges. High performing and with excellent seakeeping characteristics, these boats are ideally suited for interception and patrolling territorial waters.

Contiguous zone (< 24 nm)

- No matter how long a coastline is, contiguous zones are best patrolled by NVL patrol boats, which are characterised by their speed, performance and versatility. The proven design guarantees maximum reliability and endurance.

Exclusive economic zone (200 nm)

- The exclusive economic zone (EEZ) is best patrolled by offshore patrol vessels built by NVL Group. Their multirole and multi-mission platforms provide permanent maritime security in the operational area due to their endurance and excellent sea-keeping capabilities.

Strong support for cost-efficient naval vessel operations

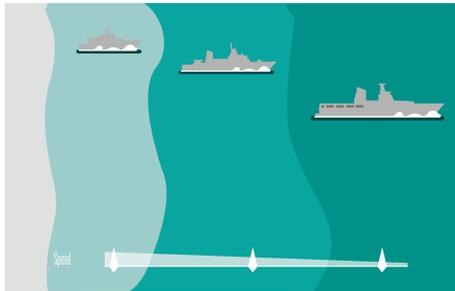
Whatever the requirement, NVL Group works in partnership with its customers to establish the right solutions. We offer the option to build vessels at one of our NVL Group shipyards or we can transfer both

our knowledge and technology, developing our partner's maritime industry. In all cases, we focus on delivering technically advanced, high-quality ships that balance a navy's operational needs with its available budget. NVL Group also provides sustainability support for existing fleet structures in the form of upgrades, spare parts supply, training, technology and knowledge transfer and other services to maximise the potential of any navy vessel.

Your naval solution

NVL Group provides you with feasible and economical solutions to fulfil the tasks of today and overcome the challenges of the

future. We aim to ensure each ship entrusted into our care remains mission ready at every stage of its operational life. NVL Group maritime patrolling solutions offer reliable and versatile multi-mission performance, providing a cost-effective yet comprehensive means of meeting maritime security needs across the seven seas.



The maritime zones (from left to right): territorial sea, contiguous zone, EEZ



NVL Group works closely with the customer to enable local build and the transfer of knowledge and technology



Fast interceptor boat 25

NVL · THE DNA OF SHIPBUILDING



Fast patrol boat 41

NVL Group is a privately owned group of renowned Northern German shipyards and related companies, formerly known as Lürssen Defence. Customers can rely on the company to consistently provide tailored, smart and cost-effective naval solutions that keep navies mission ready around the world. With deep roots in shipbuilding, NVL Group delivers high-quality naval and coast-guard vessels, as well as comprehensive services throughout the entire life cycle of their fleets. Construction at NVL Group's shipyards is supplemented by licensed manufacture at customer facilities worldwide under technology transfer arrangements. As an independent enterprise, the company remains flexible to market changes and operates a dynamic, safe and future-oriented business.

More about NVL Group's naval solutions:

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Israel Shipyards is a One-Stop-Shop

Providing Customized Services from Shipbuilding to Shipyard Construction

Israel Shipyards Ltd. is a One-Stop-Shop offering an extensive range of marine services to Naval and Law Enforcement customers around the world, across a wide range of markets – tailoring a unique solution for every need. The company's services – from building various types of Naval vessels to constructing shipyards at customer locations – are focused on defense and security.

In order to safeguard territorial waters, coastlines, internal waterways and EEZs – and to provide capabilities for seaborne interdiction and the prevention of terrorist and criminal activities including piracy – Israel Shipyards offers three main vessel types. The OPV (Offshore Patrol Vessel) Family, the SHALDAG (Fast Patrol Craft) FPC Family, and the Corvette Family are all operationally-proven, mission-ready, and in service with Navies around the world. These vessel families are built at the company's ultra-modern facilities on the Eastern Mediterranean and provide a unique level of security and survivability. Full training for technical and operational crews regarding vessel capabilities and operation are provided by the company.

In addition to shipbuilding, Israel Shipyards provides full maintenance services for all types of maritime vessels. Using its Syncrolift, the company performs equipment maintenance, repairs, renovations, and upgrades.

The company also offers Transfer of Technology (TOT) services – from shipbuilding and ship maintenance to the construction of shipyards in customer countries. Based on unique and individually-designed packages, these services are available for various knowledge and experience levels. Provided by Israel Shipyards' highly-skilled experts, the TOT training results in a high level of professionalism, enabling future needs to be met by local teams in the customer's country.

As an important added value, Israel Shipyards supports the customer's need for state-of-the-art armament systems. Providing a unique advantage, the company sources today's most innovative solutions from among Israel's leading defense companies, whose technologies are based on their extensive experience accumulated during years of development and implementation.

Whatever the request, for each customer, a comprehensive, personalized plan is created – based on the needs, available infrastructure, existing capabilities, and budget – in order to

provide the most complete and cost-effective defense and security solutions.

Commenting on these unique service offerings, the CEO of Israel Shipyards, Mr. Eitan Zucker, said, "We are committed to and continuously work towards tailoring solutions for each customer according to their demands, capabilities and requirements. We work closely and in full cooperation with the Israeli defense companies, ensuring that every vessel is equipped with the most advanced technologies and that our customers receive the most effective and comprehensive solution that precisely meets their needs for any required armament or other Naval system."

MARITIME VESSEL FAMILIES

The Offshore Patrol Vessel (OPV) Family



OPV 62m



OPV 45m

The OPV Family – which includes the OPV-62 and OPV-45 – is designed for the protection of coasts, drilling rigs, and offshore facilities. They are advanced, cost-effective vessels made of steel hulls and aluminum superstructures with a weapon-carrying capacity equal to larger, more costly vessels. OPV weapon control and navigation systems are installed on the command bridge, allowing centralized control by the ship's commander.

© Photos Credit-Israel Shipyards Ltd.

The SHALDAG Fast Patrol Craft Family (FPC) for Law Enforcement



SHALDAG MK V



Shaldag MK II

The combat-proven SHALDAG Family – which includes the SHALDAG MK II, III, IV, and V – integrates an array of innovations developed by Israeli defense experts in response to real-life security challenges. The SHALDAG design also draws on the Family's extensive operational experience across a wide range of environments. These all-aluminum vessels driven by water jet have a speed of above 45 knots, even in rough seas. They accelerate from zero to 40 knots in less than one minute, and have a turning diameter of 150m and minimal draft – enabling operation in shallow waters. Advanced, lightweight weapon systems equip them for security tasks where high intercept speeds and easy maneuverability are needed, without sacrificing vessel control.

The Corvette Vessel Family



SAAR S-72

The Corvette Family includes the SA'AR line of exceptionally reliable, battle-proven vessels and the new RESHEF Class. The SA'AR S-72 multi-mission vessel has a modular design that enables it to be used either in naval warfare or, when equipped with lighter weaponry, used as an OPV. Hybrid propulsion enables the vessel to switch automatically to diesel upon acceleration. The vessel is ideal for a variety of missions – from Search & Rescue, open sea patrol, and surveillance to the protection of maritime borders and offshore facilities.



Saar S-80

The company's new RESHEF Class, a cutting-edge combat vessel, replaces the SA'AR 4.5 which has been in service for 20+ years. Designed for the Israeli Navy and based on the SA'AR S-72's proven advantages, the new vessel will include the advanced capabilities that will be required in future combat scenarios. Withstanding a wide range of evolving threats and challenges, the RESHEF will reliably protect EEZs and offshore oil and gas facilities.

Transfer of Technology



Shipyard infrastructure

HAVELSAN BAHA SUB-CLOUD AUTONOMOUS UNMANNED AERIAL VEHICLE

UAVs have become indispensable elements of modern combat fields due to the increasing complexity and strategical importance of war systems with the developing technology.

With features that meet the needs of modern armies, BAHA is a Sub-Cloud Autonomous UAV that can perform joint operations with all unmanned systems with its vertical landing and take-off capability, fully autonomous mission capability, modular architecture that allows the integration of different payloads and many more superior features.

BAHA is a fixed-wing Sub-Cloud Autonomous Aircraft designed to endure the harsh conditions of the battlefield. The system utilizes electric motors in vertical take-off and landing and uses an electric/petrol engine for horizontal flight. Capable of performing missions up to 10.000 feet, BAHA can stay in the air for up to 6 hours with a petrol engine (or up to 2 hours with the electric configuration) and offers a range of up to 50 km. In addition, BAHA has a payload capacity of 5 kg.

The UAV has a wingspan of 3.7 m. The system is designed to be easily installed by two people and operated by two personnel. The system can be prepared for mission within minutes.

Equipped with a high-end autopilot system, BAHA can return to the take-off point automatically in emergency cases such as data link loss. The system performs ISR tasks regardless of the time of day. Many mission types can be carried out quickly with BAHA. Tracking, Detection and Area Protection, Intelligence, Electronic Warfare, Coastal and Border Security, Power Transmission and Oil-Gas Lines Inspection, Smuggling and Counterterrorism are just some tasks that BAHA can perform. BAHA is one of the fundamental elements of the HAVELSAN Digital Troops concept.



HAVELSAN BARKAN AUTONOMOUS MEDIUM-CLASS COMBAT UGV SYSTEM

The frequency and diversity of security threats in the world have increased for land forces. Autonomous unmanned ground vehicles integrate modern technology into military units, by sensing the environment through remote management or using sensor systems, and performing main tasks such as reconnaissance, surveillance, and logistics transport without personnel within the scope of the requirements of digital battlefields. Unmanned ground combat vehicles, available in different sizes and configurations for different needs, have gained qualities that can fulfill many tasks.

HAVELSAN designed and produced BARKAN in response to the needs of the modern battlefield. BARKAN is an essential assistant for field personnel in many areas, especially in increasing the operation's success, preventing losses, and reducing operational costs. With its remote control and autonomous mission capabilities in the operational theaters of the future, BARKAN will be a close assistant to the military units. BARKAN's swarm infrastructure makes joint operations with other land and air vehicles possible, and the unmanned team can be operated from a single operations center. BARKAN can be used in multi-purpose missions thanks to its superior autonomous features and its modular design in which different payloads such as CBRN sensors, robotic arm, and bomb launcher can be integrated. In this way, BARKAN can carry out many tasks varying from carrying or towing cargo, providing close protection, armed reconnaissance to bombing disposal.

BARKAN has been developed to cope with different types of threats under the most challenging conditions. The vehicle can easily traverse difficult floors quickly and silently with its electric motors. The system exhibits superior capabilities against electronic warfare attacks, which are an asymmetrical threat to the battlefield of today and the future. With the Tactical Data Link System, BARKAN has a high resistance to Jammers affecting its communication capability over a 1 km Line of Sight



© Havelsan

In addition, in areas where the Line of Sight is lost, and jammers work effectively, the vehicle can perform its duty without delay with its Wired Communication module. BARKAN, which has 360° surround vision capability with its day and night cameras. It can be used effectively in Day/Night missions with its EO and IR (Thermal) Cameras.

Standing out with its autonomous features, BARKAN can perform autonomous capabilities such as leader following, autonomous patrol, drone and person detection, obstacle avoidance, and return to home quickly and successfully.

BARKAN is an indispensable element of the HAVELSAN Digital Troops concept.

Battle Rifle BW-20 (7.62X51mm)

The Pakistan Ordnance Factories (POF) has officially launched its newly designed battle rifle BW20 at the World Defense Show exhibition, which was held last March in Riyadh, Saudi Arabia.

Briefing about the rifle, POF spokesperson, Salman Ali Khan, said that they have initially launched three variants of the BW20 rifle – a 16” Standard rifle, a 12” Assault rifle, and a 20” Match Grade Marksman rifle. All of them are chambered in 7.62 x 51mm and uses G3 based roller-delayed blow back mechanism. The BW20 rifles are cost effective, lighter in weight, and offer the same accuracy, range, and penetration as required by Pakistan Army’s General Staff Requirement (GSR).

The POF spokesperson added that the production cost of BW-20 rifle could be comparatively less than that of G3. Further, some advance mechanisms have been introduced that reduce the recoil of the 7.62 x 51mm rifle. The rifle is a part of Battle Weapons (BW) Gun series developed by the POF at the request of Pakistan Army for next generation rifle. The principal design of BW-20 rifle has the same mechanism as the Heckler and Koch G3, which is Pakistan Army’s standard battle rifle and is currently a POF’s product.





© The Chairman of the Pakistan Ordnance Factories (POF) Board Lt. General Ali Amir Awan HI(M)

DESCRIPTION

In 2016, during the extensive induction trials of Pakistan armed forces, Roller-Delayed blowback based G3A3 was put against modern gas-operated weapons from various OEMs in which G3A3 outperformed its competitors in Accuracy, Range and penetration. Based on trial's outcome, Roller delayed blowback was retained by Pakistan Armed forces.

Considering the need of a new weapon, POF came with the idea of BW-20 series. BW-20 series of rifles chambered in 7.62x51mm, 7.62x39mm and 5.56 are series of rifles developed by POF to meet the requirements of modern day military and law enforcement requirements.

Based on the roller-delayed blowback mechanism, the series features high precision, accuracy, reliability and durability. Based on years of experience from combat zones, extensive trials

and manufacturing experience, the rifle has what is required to take on the challenges of modern warfare while retaining all the strength required addressing the traditional requirements of conventional military warfare.

A single platform that addresses battle, assault and marksmanship requirements. The Rifle features:

- High Accuracy
- Free floating Barrel
- Rail for optical devices and accessories
- Reduced felt recoil
- Ambidextrous loading
- Adjustable stock

From manufacturing standpoint, these rifles can be mass-produced by any arms manufacturer, which has an established production line of Rifle G3, without any major investment in machinery, and this makes it the ideal contender.

Specifications

Type	Battle	Assault	Marksman
Caliber	7.62x51	7.62x51	7.62x51
Total length, mm	945	845	1100
Total width, mm	65	65	65
Barrel length, mm	406	300	560
Twist rate	304.8	304.8	304.8
Grooves	4R	4R, Polygonal	4R
Rate of fire	600-700 RPM	575 RPM Approx.	-
Magazine	Polymer Magazine, 20rds Capacity	Polymer Magazine, 20rds Capacity	Polymer Magazine, 20rds Capacity
Weight, Kg	4.1	4	5.2
Mechanism	Roller Delayed blowback	Roller Delayed blowback	Roller Delayed blowback

6 NEW ICARUS MARINE 15.4M PATROL BOATS DELIVERED TO BANGLADESH COASTGUARD



Icarus Marine recently designed a 15,4m High Speed Patrol Boat for the Bangladesh Coast Guard. The vessel is powered by 2 x 550hp Volvo Penta engines and is capable of a maximum speed of 27 knots with a range of 300Nm. Carrying capacity is 12 personnel and the vessel is equipped with 4 bunks and one HMG station. The vessel is classed under Bureau Veritas. The design is available with different propulsion options and speeds up to 45 knots can be reached with alternative propulsion. Contact us for further information. Khulna Shipyard Ltd of the Bangladesh Navy constructed 6 vessels off this design and sea trials were conducted on 15 September 2021.

Principal Particulars

Length Overall : 15.4 m.
 Breadth (Mld): 4.1 m.
 Depth (Mld): 2.1 m.
 Max. Speed: 27 knot
 Endurance: 300 Nm

Important Information

Delivery: NYF.
 Class BV.
 Client: Bangladesh Coast Guard.
 Designer: Icarus Marine, South Africa

Major Machinery & Feature/ Specialty of Vessel

Engine Brand, Power & Quantity: Volvo Penta 550 HP x 2.
 Other Major info to be given: High Speed Boat
 Major Feature of Specialty of the Vessel: 12 Seal, 4 Bunk, 1 HMG post

VISIT TO THE CNS BY THE NEW PERMANENT SECRETARY MINISTRY OF DEFENCE

Chief of the Naval Staff, Vice Admiral Awwal Gambo and thenewly apointed Permanent Secretary Ministry of Defence, Dr Ibrahim Abububakar Kana mni.



Nexter to supply 8 105 LG artillery guns to Armed Forces of Senegal



© Nexter

The contract for the supply by Nexter to the Armed Forces of Senegal of 8 105 LG guns and 105mm ammunition came into effect on April 20. The 105LG is a 105mm towed artillery gun renowned for its reliability and unmatched lightness (1,650 kg). Its ability to be transported by any type of vehicle, aircraft, helicopter, and even parachute, ensures it is ideally mobile for troops operating in extreme climates and difficult terrain.

The Senegalese army chose this gun because it perfectly meets the requirements of modern combat: thanks to its lightness and unrivaled rate of fire, it can be put into battery in less than 30 seconds by a crew of 5 gunners, firing 12 rounds per minute, and this, at a maximum range of 17 km thanks to Nexter Arrowtech's ERG 3 105mm extended range ammunition. If necessary, it can escape detection by trajectory radars thanks to the very low arrow of its trajectory's intense firing, up to a range of 11 km. It is also capable of direct fire up to 2 km.

The 105 LG, qualified by the French army, is already in service with the armies of many countries: Singapore, Thailand, Indonesia, Belgium, Canada, Colombia, and very recently Malaysia, which confirms the renewed interest in the artillery of this caliber worldwide. Moreover, this contract with the Armed Forces of Senegal is the first direct sale between Nexter and the Armed Forces of Senegal. MIt comes shortly after Nexter supplied the six Narwhal remotely operated naval which equip the three patrol boats ordered for the Senegalese Navy.

Dominique Guillet, director of the Weapons and Ammunition business unit at Nexter, was delighted with this sale, which "initiates a fruitful cooperation between Nexter and Armed Forces of Senegal".

NIGERIAN AIR FORCE TO INVESTIGATE CAUSE OF TRAINER AIRCRAFT CRASH IN KADUNA



The Chief of Air Staff, Air Marshal Oladayo Amao, has stated that the Nigerian Air Force (NAF) will ensure it thoroughly investigate the cause of the Super Mushshak trainer aircraft crash that occurred on 19 April 2022 at NAF Base, Kaduna. He stated this when he visited Kaduna to commiserate with families, friends, and colleagues of the 2 pilots, Flight Lieutenant Abubakar Muhammed Alkali and Flight Lieutenant Elijah Haruna Karatu, who lost their lives in the tragic accident. Air Marshal Amao had constituted an Accident Investigation Board upon receiving the sad news of the crash yesterday, to determine the immediate and remote causes of the crash. While at Kaduna earlier today, he assured the officers, airmen and airwomen of 401 Flying Training School that all measures will be emplaced to avert similar occurrence in the future. He also reminded them on the need to remain steadfast and focused on their assigned roles and responsibilities in view of the onerous task before the NAF and other security agency to rid the Northwest and indeed the entire Nation of all criminal elements.

ALL SET FOR THE LATE PRESIDENT MWAI KIBAKI'S NATIONAL REQUIEM MASS

H.E Hon. Uhuru Kenyatta, President of the Republic of Kenya and Commander-in-Chief of the Defence Forces on Monday, 25 April 2022 led the country in a public viewing of the body of the late retired President Mwai Kibaki at Parliament Buildings in Nairobi.



VEEP INAUGURATES JOINT VENTURE COMPANIES UNDER DIHOC



An inauguration ceremony for the Joint Venture Companies under the Defence Industries Holding Company Limited (DIHOC) has been held on Monday 4, April 2022 at Burma Hall in Burma Camp, Accra.

The Guest of Honor for the programme, the Vice President of the Republic of Ghana and Chairman of the Armed Forces Council, His Excellency Dr Alhaji Mahamadu Bawumia in his address congratulated the Ghana Armed Forces (GAF) for the auspicious occasion to celebrate the laudable initiative and its continuous effort in preserving our territorial integrity and the general peace across our nation and beyond.

He stated that GAF and all other security establishments in the country have mainly depended on the importation of security hardware and equipment for their operations, therefore this joint venture between private entities and GAF presents an attractive cooperation in driving the industrialization strategy of the Government of Ghana.

Dr Bawumia also called on the business community and stakeholders to invest and collaborate with GAF to develop a diversity of production value chain that would benefit both the military and civilian personnel.

The Chief of the Defence Staff (CDS) of the Ghana Armed Forces, Vice Admiral Seth Amoama in his speech said that to effectively manage the human security challenges confronting the country, it is important for GAF to become more proactive and contribute towards national development.

He added that the establishment of DIHOC therefore conforms to all legal requirements, provided by the 1992 constitution which lends credence to the proposition for GAF to engage in developmental projects.

DIHOC is solely a GAF initiative which was formed to separate socio-economic activities from its core duties. It also focuses on the provision of critical logistic needs of GAF and engages in Civil-Military collaboration for socio-economic development projects.

Ugandan Aviation Company Signs for a Bell 412Epi

Bell Textron Inc., a Textron Inc. company, announced a signed purchase agreement with BAR Aviation for a Bell 412Epi to support 24/7 medical evacuation missions and the new development of oil and gas projects in Uganda.

BAR Aviation is a leading aviation operator in Uganda known for its high quality and professional air transport service in Uganda and the region. Among its many services, BAR Aviation provides air medical evacuation services to support communities and connect them to life-saving medical support.

“We are privileged to provide BAR Aviation with exceptional Bell products to service and complement their successful aerial operations,” said Lynette Loosen, regional sales manager, Africa and the Middle East, Bell. “The Bell 412 has proven its capabilities and fit for purpose to BAR Aviation and the company is growing its Bell 412 fleet in East Africa.”

In January 2021, BAR Aviation took delivery of the first Bell 505 in Uganda and the first fully equipped emergency medical service Bell 505 in Africa. The aircraft carries out medical evacuation missions in the region.

“We pride ourselves on going beyond our clients’ expectations by providing an exceptionally broad spectrum of aviation services with a robust team of knowledgeable and experienced professionals who believe in client satisfaction — and- we do so by operating Bell aircraft,” said Barak Orland, chief executive officer, BAR Aviation. “BAR Aviation is very excited to be adding the Bell 412Epi to strengthen its growing Rotary Wing fleet thus contributing to the success of its various missions.” “Barak Orland is a visionary, and we are so proud to be associated with him and the BAR Aviation family,” said Sameer Rehman, managing director, Africa and the Middle East, Bell. “Bell looks forward to further strengthening our relationship with Bar Aviation to enhance its service offerings in Uganda and beyond.”

To date, there have been more than 1,100 Bell 412s delivered across the globe, logging over 6.5 million flight hours. There are currently more than 160 Bell 412s operating in Africa and the Middle East. Customers continue to rely on the rugged and reliable Bell 412, which carries operators through parapublic, offshore, emergency medical service and even VIP missions every day.

© Bell Textron Inc





Enhancing Mission Effectiveness

INTRACOM DEFENSE (IDE) is a highly acclaimed Defense Systems Company in Greece, with an outstanding record of participation in domestic programs and exports to quality-driven international customers.

IDE utilizes high-end technologies in the design and development of advanced products in the areas of Missile Electronics, Tactical IP Communications, Integrated C4I Systems, Surveillance, Hybrid Electric Power Systems, and Unmanned Systems. The Company retains its international recognition through the long standing participation in European and NATO new technology development programs. Utilizing advanced production capabilities and large-scale project management know-how, IDE is a key player in the high technology sector of the Hellenic Defense Industry.



www.intracomdefense.com

USS Hershel “Woody” Williams crew hosts Women, Peace, and Security event in Djibouti



The conference supports a larger mission led by U.S. Africa Command and U.S. Naval Forces Europe-Africa to facilitate meaningful participation of women within the security sector.

Maj. Gen. William Zana, commanding general, Combined Joint Task Force-Horn of Africa, and guests from Djibouti, France, Italy, Kenya, Spain and the U. S. participated in a Women, Peace, and Security conference Nov. 15, 2021.

"These events are opportunities to show the United States Navy's commitment to encouraging women leaders in the security sector and to making sure they are included in global peace processes." - Cmdr. Ernique Sesler

The conference coincided with the Expeditionary Sea Base USS Hershel “Woody” Williams’ regularly scheduled port visit to Djibouti as part of the ship’s deployment circumnavigating Africa. Guest speakers included Zana; Cmdr. Ernique Sesler, executive officer, USS Hershel “Woody” Williams; and Djibouti Armed Forces Lt. Col. Amina Mohamed Moussa, commander of the Army Female Battalion.

"We are proud to be hosting the second Women, Peace, and Security conference of this deployment," said Sesler. "These events are opportunities to show the United States Navy's commitment to encouraging women leaders in the

security sector and to making sure they are included in global peace processes."The conference supports a larger mission led by U.S. Africa Command and U.S. Naval Forces Europe-Africa to facilitate meaningful participation of women within the security sector. WPS events are designed to engage with local communities and partner nations to build relationships and gain local insight and knowledge.

"The WPS training the ship’s leadership received in July was instrumental in the crew being able to participate in such engagements instead of being spectators," said Lt. Cmdr. Shanece Kendall, NAVAf gender focal point. "As our efforts mature, we will continue to foster this approach in order to garnish more support from service members and government civilians in furthering the WPS agenda."

WPS engagements focus on integrating WPS-related issues into education, military operations, and military and civilian institutions through meaningful discussions and peacekeeping capability building activities and exercises. For over 70 years, U.S. Sixth Fleet forces have forged strategic relationships with our allies and partners and solidified a foundation of shared values, experiences, and vision aimed at preserving security and stability.

©U.S. Naval Forces Europe-Africa



Brig. Gen. Rose Keravuori, deputy director of intelligence, U.S. Africa Command, in coordination with the U.S. Embassy in Nigeria's Office of Security Cooperation, visited Nigeria in March 2022 to conduct key leader engagements with the Nigerian military. As part of the visit, Keravuori hosted a women's luncheon with 17 female officers from each of the Armed Forces of Nigeria military services and the commander of the Nigeria Army Women's corps. Discussions focused on promoting women, peace, and security objectives and deliberations on the role women play in peacekeeping and security.

Morocco-Israel: Signing of a Memorandum of Understanding (MOU) in the Aviation Industry Sector with Israel Aerospace Industries



© Israel Aerospace Industries (IAI)

A Memorandum of Understanding (MOU) in the aeronautics sector was signed during the meeting between the Minister of Industry and Trade, Mr. Ryad Mezzour, and the Chairman of the Board of Directors of Israel Aerospace Industries (IAI), Mr. Amir Peretz.

This partnership is part of the implementation of the Joint Declaration between Morocco and Israel signed on December 22, 2020 in Rabat, in which the two countries expressed their willingness to promote dynamic and innovative bilateral economic cooperation in the fields of investment and technology.

This MOU includes, for the Moroccan side, the Ministry of Industry and Trade, the Ministry Delegate to the Head of Government, in charge of Investment, Convergence and Evaluation of Public Policies, and, for the Israeli side, the company Israel Aerospace Industries (IAI), represented by its Chairman of the Board of Directors, Mr. Amir Peretz, and its President and CEO, Mr. Boaz Levy.

"This is a strategic partnership for both countries that we are sealing today. It opens the way for win-win industrial collaboration in the aerospace industry. This partnership leverages IAI's aviation

expertise and the technological capabilities of our aerospace platform and its positioning as a growth driver for the investment and development in advanced industrial and aeronautical services sectors," said Mr. Mezzour. He stressed that this agreement responds to national priorities to promote advanced training, employment, local manufacturing, as well as R&D and innovation.

Amir Peretz, Chairman of the IAI Board of Directors, said: "The MOU we are signing today is an additional step in creating a new partnership between IAI and the aviation and space industries in Morocco. I am familiar with the incredible potential that exists in Morocco, and this is just the beginning. Together, we will build joint teams that will turn our vision into reality. Today, I am filled with pride that my country, Israel, is coming together with the country I was born in, Morocco. I am proud that both countries that make up my identity are stepping forward, together, towards a brighter future. Aligned with our mutual values, the friendship between our nations will continue growing as we bring forward more cooperation and opportunities."

For his part, IAI President and CEO, Boaz Levy said: "The cooperation agreement, signed between IAI and Morocco, is another expression of the deep partnership between the two countries and will help promote joint and commercial projects in the aviation industry. As part of its strategy, IAI expands its business into new markets and provides advanced technology solutions to customers around the whole world. We are proud to sign this agreement and believe it is a partnership that will lead to new joint developments and advance the global aviation industry."

As part of this partnership, Morocco and IAI have identified investment opportunities focusing on 3D printing, the manufacture of cabin interiors and engine parts and aerostructures, as well as the establishment of an R&D and engineering center and the development of a eco system of local suppliers through sourcing partnerships with IAI.

During its stay in Morocco, the IAI delegation visited, on Tuesday 22 March, the aeronautical center of Nouaceur to learn about the achievements of the Moroccan aviation industry and its rise in skills, the investment potential in Morocco in the sector as well as the capacity for local development in the maintenance and transformation of aircraft.

During this visit, the Israeli delegation also visited the Institute of Aeronautical Professions (IMA) where it was able to appreciate the competence and technicality of Moroccan talents.

Donated field hospital increases care capacity in Agadez, Niger



To address civil medical vulnerabilities related to COVID-19, the U.S. donated a \$1.6 million mobile field hospital to Niger's Agadez Regional Council on April 4, 2022. "This was not just constructing a mobile field hospital, but an opportunity to partner with the citizens of the city and provide training for the hospital maintenance team so they feel confident to fix any problems that should occur." - Spc. Leszczusk. "This mobile field hospital is a huge opportunity for the region," said Dr. Iro Baoua, director, Agadez Regional Health Council. "I am very happy with the working partnership between Air Base 201 and the local and regional government."

© AFRICOM-photo by Capt. Keith Richard

One of many Overseas Humanitarian, Disaster Assistance, and Civic Aid projects, the mobile field hospital was financed through U.S. Africa Command to expand partner nation capabilities to care for a wider range of critical patient needs. The 4,592 square-foot mobile field hospital increases Agadez Regional Hospital's capacity by an additional 30 beds, complete with the medical tools and resources to care for the 670,000-person community and surrounding areas. "Being a trusted partner means investing with our Nigerien partners in ways that will help strengthen defense capabilities and counter shared transnational threats which can range from COVID-19 to violent extremist networks," Maj. Gen. Ken Ekman, U.S. Africa Command director of strategy, plans and program. "This facility will improve our partnership in areas of pandemic and disaster response capability."

In May of 2021, U.S. Army Civil Affairs, in coordination with regional leaders and U.S. Embassy-Niger, identified COVID-19 vulnerabilities within Agadez Regional Hospital resulting in the project's proposal. "Before the construction of this mobile field hospital, the only place to treat patients was in close proximity to others. Now that there is a separate, isolated facility, the spread of the COVID-19 virus will drastically decrease and keep vulnerable patients from being exposed," said U.S. Army Spc. Mary Leszczusk, 404th Civil Affairs Battalion. "This was not just constructing a mobile field hospital, but an opportunity to partner with the citizens of the city and provide training for the hospital maintenance team so they feel confident to fix any problems that should occur."

Once approved and financed, U.S. Africa Command enlisted U.S. contractors to build and train Nigerien workers on construction, de-construction and maintenance of the mobile field hospital. This knowledge exchange enables Agadez Regional to maintain the field hospital autonomously while also allowing the facility to be repurposed by the Government of Niger once the COVID-19 threat subsides. "Many of the rural communities have limited access to medical care," said U.S. Army Staff Sgt. Peter Maenner, 404th CAB team sergeant. "This mobile field hospital can be re-deployed to more remote environments in the case of pandemic outbreaks or other critical needs."

This donation follows a similar mobile field hospital donation in Niamey in March 2021 and reinforces the U.S. commitment to partnering with the Nigerien government to help ensure the health and security of Niger's citizens.



NIGERIA – AH-1Z ATTACK HELICOPTER RELATED FMS ACQUISITIONS

The State Department has made a determination approving a possible Foreign Military Sale to the Government of Nigeria of AH-1Z Attack Helicopter Related FMS Acquisitions and related equipment for an estimated cost of \$997 million. The Defense Security Cooperation Agency delivered the required certification notifying Congress of this possible sale today.

The Government of Nigeria has requested to buy twelve (12) AH-1Z Attack Helicopters; twenty-eight (28) T-700 GE 401C engines (24 installed, 4 spares); and two thousand (2,000) Advanced Precision Kill Weapon System (APKWS) guidance sections. Also included is Night Vision Cueing Display (NVCD); commercial variant GPS with Standard Positioning Service (SPS);

communication equipment; electronic warfare systems; AN/AVS-9 Aviator's Night Vision Imaging System; M197 20mm machine gun; Target Sight System (TSS); support equipment; spare engine containers; spare and repair parts; tools and test equipment; technical data and publications; personnel training and training equipment; Mission Planning system; U.S. Government and contractor engineering; technical, and logistics support services; U.S. Government and contractor assistance and oversight of facilities construction to include the provisioning of plans, drawings and specifications; \$25M of case funds will be allocated for institutional and technical assistance to the Armed Forces of Nigeria (AFN) to continue Air Ground Integration (AGI) program, which includes developing targeting processes that are legally compliant with International Humanitarian Law and the Laws of Armed Conflict; and other related elements of logistics and program support. The total estimated program cost is \$997 million.

This proposed sale will support the foreign policy goals and national security objectives of the United States by improving the security of a strategic partner in Sub-Saharan Africa.

The proposed sale will better equip Nigeria to contribute to shared security objectives, promote regional stability and build interoperability with the U.S. and other Western partners. This sale will be a major contribution to U.S. and Nigerian security goals. Nigeria will have no difficulty absorbing the equipment and services into its armed forces.

The proposed sale of this equipment will not alter the basic military balance in the region. The principal contractors will be Bell Helicopter, Textron, Fort Worth, TX; and General Electric Company, Lynn, MA. There are no known offset agreements in connection with this potential sale.

Implementation of this proposed sale will require the assignment of U.S. Government or contractor representatives to Nigeria for mobile training teams and contract logistics support. The case will include special training on the law of armed conflict and human rights, and air-to-ground integration to minimize civilian harm in air operations. This proposed sale will also require multiple trips by U.S. Government and contractor representatives to participate in program and technical reviews plus training and maintenance support in country, on a temporary basis, for a period of five (5) years. It will also require approximately three (3) contractor support representatives to reside in country for a period of two (2) years to support this program.

© Bell Helicopter



Leonardo C-27J Next Generation, unrivalled performance and mission flexibility

Widely recognized as the most effective multi-role military transport aircraft in its size class, the C-27J Next Generation features new avionics and aerodynamic developments for greater efficiency and improved operating performance.

An unrivalled tactical solution

Used in the most challenging operational environments, from the high altitudes of the Andes to Afghanistan, the C-27J's performance and operating efficiency are enabled by new avionics, featuring a glass cockpit with five multi-functional color screens, a

radar system for tactical transport missions and advanced communication systems. The system architecture guarantees interoperability with other transport aircraft and can be easily integrated with in-flight refuelling, self-protection, secure communications and ballistic protection, allowing the aircraft to operate in high threat environments, transporting materials, light vehicles and personnel to wherever they are needed. The C-27J can operate in complete autonomy thanks to its Auxiliary Power Unit (APU).

Unmatched capacity

The C-27J boasts the largest cargo compartment in its category, capable of supporting about five tonnes per square metre and adjustable in height and inclination for easy loading and unloading. With the best descent and climb rates (4,000ft/min and 2,500 ft/min), it can perform tactical maneuvers at 3g and is qualified for short take-off and landing (STOL) on snowy, sandy and unprepared runways.

For a vast range of missions

A multitude of kits and easy to install and transportable roll-on/roll-off mission systems allow the C-27J to be rapidly transformed into the configuration required for the relevant mission. As a 'tactical airlifter', the aircraft's versatility extends from airlifts of troops and cargo to airdrops of paratroopers and materials, from medical battlefield evacuation to VIP transportation, from





humanitarian assistance and natural disaster response to – last but not least - firefighting: both the Romanian and Peruvian Air Forces are using the C-27J in firefighting missions with Caylym “Guardian” containers while a more capable Fire-Fighting tank solution is in development: it involves the integration of the MAFFS 2 system for the pressure release of water / retarder. Highly effective, this solution does not require any structural modification to the aircraft which thus maintains all its operational characteristics and - a great advantage compared to dedicated solutions - guarantees a unique operational flexibility.

The C-27J can be configured in the Maritime Patrol (MPA), Anti-Submarine Warfare (ASW) and Command-Control-Communications, Intelligence, Surveillance and Reconnaissance (C3ISR) versions. The mission capabilities of the C-27J Next Generation MPA can be tailored to the specific customer needs. Typical tasks include Anti-Submarine Warfare (ASW) and Anti-Surface Warfare (ASuW), thanks to the aircraft dedicated suite and large capacity to carry weapons and sonobuoys, along with Search and Rescue (SAR), Maritime Patrol, Command, Control, Communication, Intelligence, Surveillance and

Reconnaissance (C3ISR). Six wing pylons can employ lightweight torpedoes, anti-ship missiles and naval mines.

Sensors, systems and equipment

The C-27J MPA capabilities are centered around the ATOS mission system by Leonardo Electronics Division, including up to 5 operator stations that manage the sensors, analyze the gathered information and perform a true data fusion to provide mission operators, pilots, control centers and operating assets with a detailed, real time overall tactical picture. An AESA Search Radar, Electro-Optical/Infra-Red (EO/IR) system, Electronic Support Measure (ESM) for ISR and SIGINT/ELINT tasks, Magnetic Anomaly Detector (MAD), as well as an Acoustic Subsystem, Sonobuoy and Ordnance Launchers and the flexible Stores Management System are among the typical sensors and equipment which can be installed on the C-27J Next Generation ASW.

The Communication System including data links and SATCOM capabilities allows maximum interoperability with cooperating land based, sea based and airborne units, along with quick data dissemination.

The C-27J Spartan is operated today by the Air Forces of Italy, Greece, Bulgaria, Lithuania, Romania, Slovakia, United States, both with US Coast Guard and SOCOM, Mexico, Australia, Peru, Kenya, Morocco, Chad, Zambia and a still undisclosed customer. Rugged, reliable, proven and versatile, Leonardo's C-27J Spartan has been conceived for the most demanding military scenarios: its performance and operational flexibility position it as the most effective multi-mission medium turboprop airlifter available on the market, able to operate from the most rudimentary airstrips and in extreme environmental conditions.

A recent agreement between Slovenia and Italy added a new significant customer to the client list, another country choosing the Spartan not only for its military operations but also for its flexibility to civil protection and disaster recovery tasks.

Leonardo's ATOS mission system: ready to meet maritime patrol needs

With a range of requirements in the region and beyond for maritime patrol aircraft (MPA) for security missions such as anti-piracy and military missions such as anti-submarine warfare (ASW), Leonardo considers that its "ATOS" (Airborne Tactical Observation Surveillance) mission system, which equips the company's ATR 72MP and C-27J as well as other platforms, is ready to meet the needs of customers. Customers in Europe, Africa and Australia have already selected ATOS, with more than 60 systems installed on 10 different types of aircraft.

ATOS is a mission system optimised for surveillance. Able to cover vast areas of land and sea, ATOS collects and fuses data from radar, electro-optical camera systems and other sensors to present a clear and comprehensive picture of the operator's environment. The system integrates information from its various sensors in real time and delivers useful information to the operator, minimising the time and effort needed to understand an ongoing situation. This is essential for Armed Forces, Police or other governmental operators needing to make quick and high-quality decisions.

ATOS can also support well-informed decision making through its integration into a wider surveillance network, accessing information collected by other aircraft and naval or ground units. These features make ATOS ideal for a wide variety of missions ranging from the prevention of illegal activities to border control, particularly along coastlines. The modular nature of ATOS also means that its capability can be extended beyond surveillance, for example ATOS is capable of one of the world's most complex missions: Anti-Submarine Warfare (ASW).

One of the most important features of the system is that it can be easily integrated

into any aircraft, whether that platform is new or already in operation. These can range from helicopters up to much larger fixed-wing patrol aircraft. Depending on the size of the platform, ATOS can scale accordingly, with a compact solution for helicopters such as the AW139, while a larger aircraft such as the ATR 72 would feature multiple operator consoles.

Leonardo also offers a complete ATOS-based package, delivering an aircraft integrated with its mission system and sensors. Examples include the ATR families of patrol aircraft (ATR-42/72MP, P-72A) and the C-27J Spartan multi-mission airlifter, which are manufactured by Leonardo and fitted with its own avionics solutions and sensors. This approach is becoming increasingly popular as customers are able to rely on a single supplier to deliver a complete solution.

ATOS will also soon be able to exploit cloud technologies to draw on vast shared databases, complementing the information gathered by the aircraft's on-board sensors and further expanding the system's capacity for analysis and data fusion.

The next step will be the introduction of Artificial Intelligence (AI) into ATOS. This technology will make it possible for the system to process quantities of data that are unimaginable today, ensuring that the operator has an unprecedentedly complete, real-time view of their environment.

The roadmap for the mission system is that it will become increasingly autonomous in terms of analysis, allowing users to concentrate fully on decision making. Data processing that takes several weeks today will, in the future, be completed within hours. The ATOS of the future will be connected to satellites, national and international databases, surveillance networks and, potentially, directly to the Combat Management Systems (CMS) aboard naval vessels, another of Leonardo's areas of expertise.

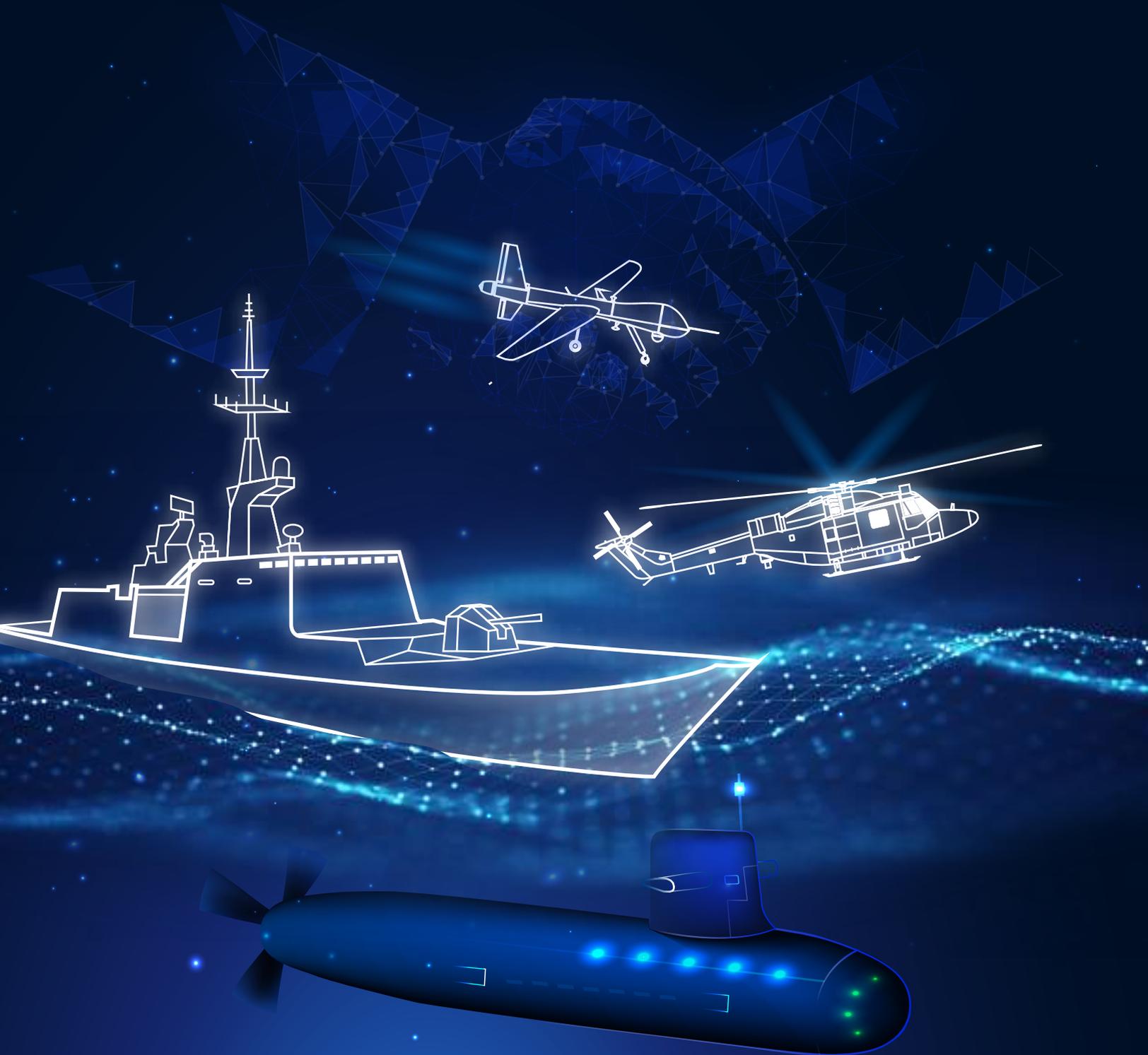
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Cruise Missile ÇAKIR: Roketsan's New Cruise Missile Brings Operational Flexibility on the Land, on the Sea and in the Air

Roketsan's Cruise Missile ÇAKIR, which can be launched from land, naval and, air platforms, is set to become a new force multiplier for armed forces with its state-of-the-art features and effective warhead.

Roketsan continues to create new concepts on the battlefield with its new technologies. ÇAKIR – Roketsan's new Cruise Missile – can be launched from fixed and rotary-wing aircraft, Assault Unmanned Aerial Vehicles (AUAVs)/UCAVs, AUSVs, tactical wheeled vehicles and naval platforms, and offers operational versatility against land and surface targets. With a range of over 150 kilometers, ÇAKIR's targets include surface targets, land and surface targets close to shore, strategic land targets, field targets and, caves.

Equipped with a domestic and national KTJ-1750 turbojet engine developed by Kale Arge and the agility brought by its design, ÇAKIR easily performs tasks involving 3D waypoints defined during mission planning. With a unique warhead and hit point selection feature, the Cruise Missile offers a high destructive force against enemy targets.

ÇAKIR owes the ability to engage targets with high precision under all weather conditions to its advanced mid-phase and terminal phase guidance systems. Network-based datalink facilitates Man-in-the-Loop capability for target update, attack/re-attack for the in-flight target of opportunity and mission abort.

The most prominent features of ÇAKIR are; its design, which allows the platform to carry multiple payloads up to four missiles, and its ability to perform swarm concept missions with inter-communicating missiles. The swarm concept, through which coordinated attack scenarios with multiple missiles are enabled, can be used to overcome hostile defence systems, and ensures high effectivity against single or multiple targets. ÇAKIR offers high survivability thanks to its unique design with radar absorbing material utilized on the frame.

ÇAKIR's ability for super sea-skimming and terrain masking in combination with radar-absorbing structure minimizes the detectability by enemy air-defence systems. Thanks to its Antijam GNSS and altimeter-supported inertial navigation system, ÇAKIR continues on its trajectory even in the event of intense electronic jamming.

Initiated with Roketsan's resources, the design studies of the indigenous and national ÇAKIR cruise missile are continuing, with first tests scheduled for 2022, and platform integration for 2023.

Within the scope of the launching meeting of the Cruise Missile ÇAKIR on March 31, 2022, a contract will be signed between Roketsan and Kale Arge on the National Turbojet Engine Development. The signature ceremony which will take place with the participation of Turkish President of Defence Industries Prof. Dr. İsmail Demir, Roketsan Chairman of the Board Prof. Dr. Faruk Yiğit, Roketsan CEO Murat İkinci and Kale Group Vice Chairman of the Board Osman Okyay, covers the development and delivery of KTJ-1750 turbojet engine to be used in the Cruise Missile ÇAKIR.



Technical Specifications of ÇAKIR	
Range	150 + km
Missile Weight	≤ 275 kg (Without Booster) ≤ 330 kg (With Booster)
Missile Diameter	≤ 275 mm
Missile Length	≤ 3.3 m (Without Booster) ≤ 4.1 m (With Booster)
Warhead Weight	70 kg
Warhead Type	High-Explosive Semi-Piercing Blast Fragmentation Thermobaric
Flight Engine	Turbojet Engine
Booster	Solid Fuel Launch Engine
Navigation Speed	High Subsonic (Mach 0.75–0.85)
Guidance	<p>Mid-Phase Guidance:</p> <ul style="list-style-type: none"> • Inertial Navigation System • Antijam Global Navigation Satellite System (GNSS) • Radar Altimeter • Barometric Altimeter • Terrain Referenced Navigation System <p>Terminal Phase Guidance:</p> <ul style="list-style-type: none"> • Imaging Infrared-IIR • RF Seeker • Hybrid (IIR+RF) Seeker
Datalink	Network-Based Bidirectional Datalink
Platforms	Fixed and Rotary Wing Air Vehicles, UCAVs, AUSVs, Tactical Wheeled Land Vehicles, Surface Platforms



Leonardo's Laser Target Designator Type 163 for the Australian Defence Force

Leonardo Australia will provide the system to the Australian Defence Force's (ADF) LAND 17 Phase 2 Digital Terminal Control System – Capability Assurance Program. More than 800 units of the Type 163 LTD have together been delivered to 27 countries, including the U.K., the U.S., Canada and New Zealand, as well as NATO members such as Italy, France, Belgium, Denmark, Netherlands and most recently Germany and Norway.

Leonardo Australia has signed an agreement with Collins Aerospace Australia to supply Type 163 Laser Target Designators (LTDs) to the Australian Defence Force (ADF). The order will be fulfilled in the second quarter of 2022. This order follows an earlier order by the ADF.

Developed by Leonardo engineers in Edinburgh, U.K., the Type 163 Laser LTD is a lightweight, compact, high-energy laser product for use by ground forces that offers an unparalleled combination of high power, reliability and portability. The Type 163 laser target designator has been designed specifically to meet all of today's special and conventional force Joint Terminal Attack Controllers (JTACs) and Joint Fires Observers (JFOs) mission requirements for marking and terminally controlling Semi-Active Air-to-Ground weapons accurately onto the target at ranges up to 10km.

The Type 163 LTD exploits Leonardo's experience in providing high-energy targeting lasers for aircraft such as the F-35 and Apache helicopter, where space, weight and power are at a premium. This means that the resulting product is able to deliver market-leading laser-designation and range finding capabilities in a compact package weighing just 2.3kg.

The product produces a high-energy laser with a narrow beam divergence and its feature set, developed with a focus on JTAC and JFO missions, includes immediate firing from switch-on and a continuous lasing capability.

The system has been battle-proven on operations, with over 800 units having now been delivered to 27 international customers, including the UK, the US, Canada and New Zealand, as well as a large number of NATO members such as Italy, France, Belgium, Denmark, Netherlands and most recently Germany and Norway.

Leonardo is the world leader in the high-energy military laser market, accounting for over 60% of all airborne laser sales globally. The company's portfolio includes the supply of lasers for the Lockheed Martin Sniper pod, Northrop Grumman Litening pod and laser spot trackers for platforms including the Tiger helicopter. Leonardo is also part of the UK Dragonfire consortium that is developing a laser directed-energy weapon with the UK Defence Science and Technology Laboratory (Dstl).

As a founding member of Tempest, the international programme to create a next-generation combat air system, Leonardo is currently developing advanced laser-based capabilities as part of the new system's Integrated Sensing and Non-Kinetic Effects (ISANKE) system.





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Leonardo's LIONFISH® systems will equip the Royal Netherlands Navy's new naval units

Already aboard a number of naval platforms worldwide, Leonardo's LIONFISH® family of defense systems has now also been selected by the Royal Netherlands Navy. The Navy has chosen the "LIONFISH® Top" variant to equip its Holland-class patrol vessels, LPD (Landing Platform Dock) and JSS (Joint Support Ship) units, Johan de Witt and Karel Doorman classes, and Den Helder-class Combat Support Ship.

The LIONFISH® Top is one of three 12.7mm variants in the new family of remotely-controlled naval turrets. "Ultralight" and "Inner Reloading" models are also available in the same calibre. The company also offers a 20mm "LIONFISH® 20" model.

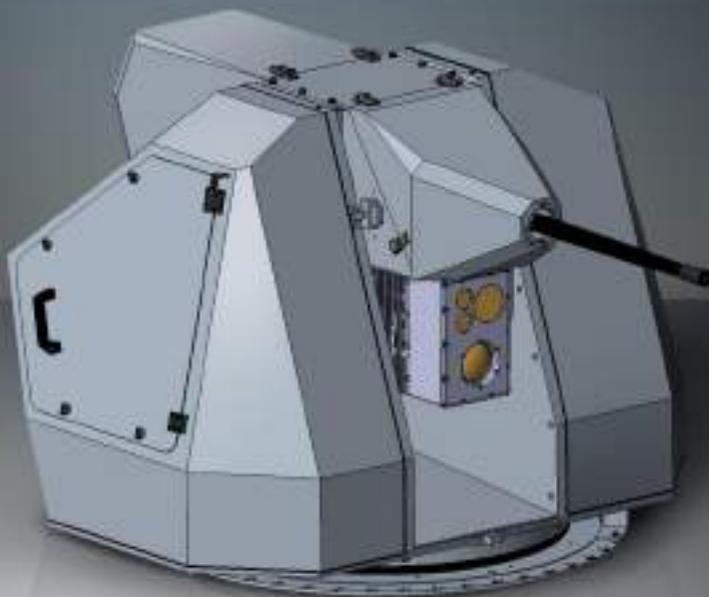
The LIONFISH® 12.7 Top weighs less than 300 kg and is particularly effective against close threats and in asymmetric scenarios (ASymmetric Warfare - ASyW). Effectiveness and accuracy, even at long range, are guaranteed by the use of a cooled infrared sensor that integrates Leonardo's Mini Colibri optics. This is common across the whole

turret family, which can also integrate an uncooled sensor. Depending on the technology used, the detection range can be up to 12 km. With customers' needs in mind, Leonardo has created state-of-the-art technologies which can effectively and accurately handle various type of threats, including uncrewed systems.

The LIONFISH® family stands out for its modularity, lightweight and common architecture, which allow the turrets to be installed and operated on board secondary platforms, both as a primary and secondary defence system, with no deck penetration. All systems in the family can self-calculate firing solutions and engage fast-moving threats, even when installed on high-speed platforms.

Drawig on its experience developing advanced technologies such as the OTO 76/62 Super Rapido and the OTO 127/64 LW Vulcano, Leonardo has developed its new defence systems to meet market requirements, that are increasingly looking towards compact and stealth technologies, including to equip uncrewed platforms. At the same time the company continues to advance its product reliability, optimise maintenance times and drive competitiveness.

The choice of LIONFISH® highlights the strategic relationship between Leonardo and the Royal Netherlands Navy, which also recently chose Leonardo's OTO 127/64 LW Vulcano systems for its four De Zeven Provinciën class multi-role units.





Eurosatory, the world's leading land and airland defence and security exhibition will be held in June 2022.

The Ukrainian crisis, which reflects the shift from asymmetric fighting to high-intensity interstate conflict, is leading EU member states to decide to invest more in their defence and security capabilities. Several countries have already significantly increased their budgets. Besides Europe, many countries are reflecting on this paradigm shift, which requires a rethinking of the models and capabilities of their armed and security forces in order to adjust to new threats. EUROSATORY 2022, the world's leading land and airland defence and security exhibition, will be held from 13 to 17 June in Paris - France.

It can directly and practically contribute to these reflections and perspectives through the very wide range of solutions presented, covering the entire spectrum of capabilities, from proven equipment to the latest technological innovations.

EUROSATORY will also be a privileged place for exchange, notably through the numerous conferences hosted and the large number of official delegations and experts attending. Now, three months away from the event, in a context of regression of the COVID 19 pandemic and lowering of sanitary restrictions in France, EUROSATORY continues to expand with already more than 1,200 exhibitors from sixty countries registered, large groups, SMEs and start-ups. EUROSATORY is shaping the future of land and airland defence and security.

IAI Completes Delivery of Dozens of SATCOM Terminals for Fighter Aircraft

Israel Aerospace Industries (IAI) has completed the delivery of dozens of SATCOM (Satellite Communication) terminals with a conformal electronically steered antenna for fighter aircraft. The SATCOM terminals are based on AESA (Active Electronic Scanned Array) technology and are installed on advanced 4.5 generation Western fighter jets. The ground-breaking technology is currently on display at Satellite 2022, in Washington D.C.

IAI's beyond line-of-sight solution ensures seamless voice and data communications, at any location, and even during fast, low-altitude flight. Utilizing a unique flush-mounted antenna, the compact AESA SATCOM system eliminates antenna and radome drag, and is therefore optimally suited to a fighter aircraft's aggressive flight envelope, as well as to other platforms requiring low-drag performance. By relying on a single LRU phased array, the technology is installed and integrated smoothly and

ensures a low life cycle cost. With a high-performance and robust network design, the system connects hundreds of registered users, and switches seamlessly between frequencies, at any given moment, according to the mission scenario and requirements. IAI's airborne SATCOM systems are pioneers in the market with decades of operational experience. The systems have been deployed worldwide on hundreds of fighter jets in a variety of models.



The Republic of Angola orders three Airbus C295s

The Republic of Angola has placed a firm order for three Airbus C295s to perform multirole operations. Two aircraft will be specifically equipped for maritime surveillance and one for transport missions.

The aircraft configured for transport missions will be able to carry out tactical cargo and troop transport tasks, paratrooping, load dropping or humanitarian missions.

The two C295s configured as Maritime Surveillance Aircraft (MSA) will play a key role for Search and Rescue (SAR), control of illegal fishing and borders, support in case of natural disasters and intelligence-gathering missions, among others. They will be equipped with the Airbus-developed Fully Integrated Tactical System (FITS) mission system as well state-of-the-art sensors.

All three aircraft will be equipped with the latest version of the Collins Aerospace Pro Line Fusion avionics suite.

With this new order, the Força Aérea Nacional de Angola becomes the 38th C295 operator worldwide.

In 2019 the Angolan State Press Agency announced that the country's Air Force is interested in buying three Airbus C295 MPA /Transport aircraft. The Angolan Ministry of Defence owned company Simpotex signed a USD \$196.7 million agreement with Airbus Defence and Space on the behest of the Angolan President João Lourenço. The deal would be funded by a Spanish Bank Banco Bilbao Vizcaya Argentaria in agreement with the Angolan Government.

The Airbus C295 is a new-generation tactical airlifter in the light and medium segment.

It is robust and reliable but also highly versatile in terms of the number of different missions it can perform. The C295 conducts multi-role operations worldwide under all weather conditions. It is fully certified and routinely operates day and night in combat missions in all weather extremes, from desert to maritime environments, from extremely hot to extremely cold temperatures.

With cabin dimensions of 12.7 m/41 ft 8 in (in length), the C295 has the longest unobstructed cabin in its class. It can accommodate up to 71 seats, offering a much higher personnel-carrying capability than its competitors in this segment. For the same reason, it can carry much more palletised cargo (up to five 88 in by 108 in standard HCU-6E pallets) with direct off-loading through its rear ramp door

The C295's STOL capability combined with a strong landing gear enable it to operate in the most austere locations with the worst conditions for take-off and landings. The C295 is a tactical military transport aircraft with a light footprint to enable operations from short (no longer than 670 m/2,200 ft), soft and rough (CBR 2) unprepared airstrips. The C295 is also designed to provide outstanding low-level flight characteristics for tactical missions, flying at speeds down to 110 knots.



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AFRICOM and law enforcement cooperation enhances maritime security in West Africa

During the month-long operation, multinational maritime forces conducted two major interdictions in the Exclusive Economic Zone of Sierra Leone and Cabo Verde.

Law enforcement representatives from several West African nations joined U.S. Sailors, Coast Guardsmen, Marines and a team from the Environmental Security Program of the International Criminal Police Organization (INTERPOL) on board the U.S. Navy Expeditionary Sea Base USS Hershel “Woody” Williams (ESB 4) to conduct operations to stop suspected illegal fishing and convergent crimes in the waters along the coast of West Africa from March 18 – April 12, 2022.

“Illegal, unreported, and unregulated (IUU) fishing is not just a crime, it is a destabilizing act, especially in parts of the world where people are challenged to feed their families,” said Gen. Stephen Townsend, commander, U.S. Africa Command. “Lawless actors, such as the PRC’s massive commercial fishing fleet, pillage African fisheries taking food out of the mouths of the people of West Africa. It is time for African governments to take a stronger stand against IUU fishing and other maritime crimes in their waters.”

During the month-long operation, multinational maritime forces conducted two major interdictions in the Exclusive Economic Zone of Sierra Leone and Cabo Verde. The first, a Sierra Leonean boarding of a fishing vessel on March 24, halted suspected illegal fishing off the coast of Freetown, with violations that carry potential jail time and fines totaling up to \$8 million.

A second fishing vessel boarding on April 1, with Cabo Verde law enforcement authorities, resulted in the seizure of approximately six and a half tons of suspected cocaine with an estimated street value at more than \$350 million, marking one of the largest non-containerized, trans-oceanic drug seizures in recent memory. Cabo Verde law enforcement authorities took seven individuals into custody during the counter-drug operation.

The INTERPOL Environmental Security team’s role was to advise and assist personnel embarked on the USS Hershel “Woody” Williams during the two interdictions, including evidence collection and preservation for future prosecution. This professional international expertise helps U.S. Africa Command reinforce its maritime security efforts by addressing the post-boarding process to ensure dossiers are available for prosecution by African nations. This collection, preservation, and legal support was provided for both interdictions.

The INTERPOL team deployed aboard the USS Hershel “Woody” Williams, providing valuable mentoring to embarked law enforcement authorities. Tailored technical and analytical support, including investigative techniques to identify fraudulent fisheries related documents and evidence collection emphasized the need for greater international cooperation in tackling illicit maritime activities relating to IUU fishing.

West African nations face serious challenges at sea, including IUU, as well as narcotics trafficking. Over the last decade, the United States has steadily increased maritime security cooperation with partners on Africa’s Atlantic coast to improve maritime domain awareness in order to help them protect their sovereign waters.

Annual military exercises, such as Obangame Express, the largest multinational maritime exercise in Western Africa, and Phoenix Express, serve to strengthen the relationships with our African partners and assist them as they build their capacities. During this year’s exercises, the USS Hershel “Woody” Williams took an active role in all training and real-world operations off the West African coast.



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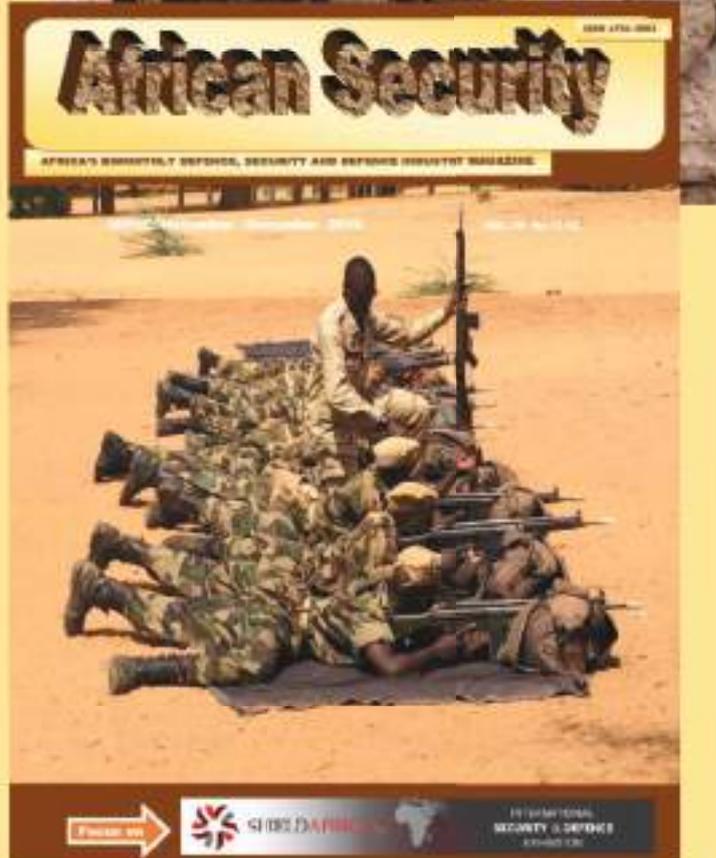
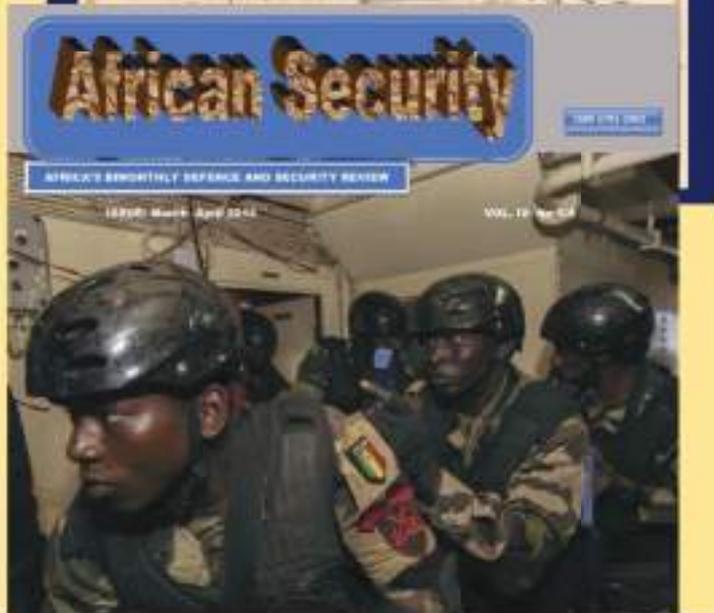
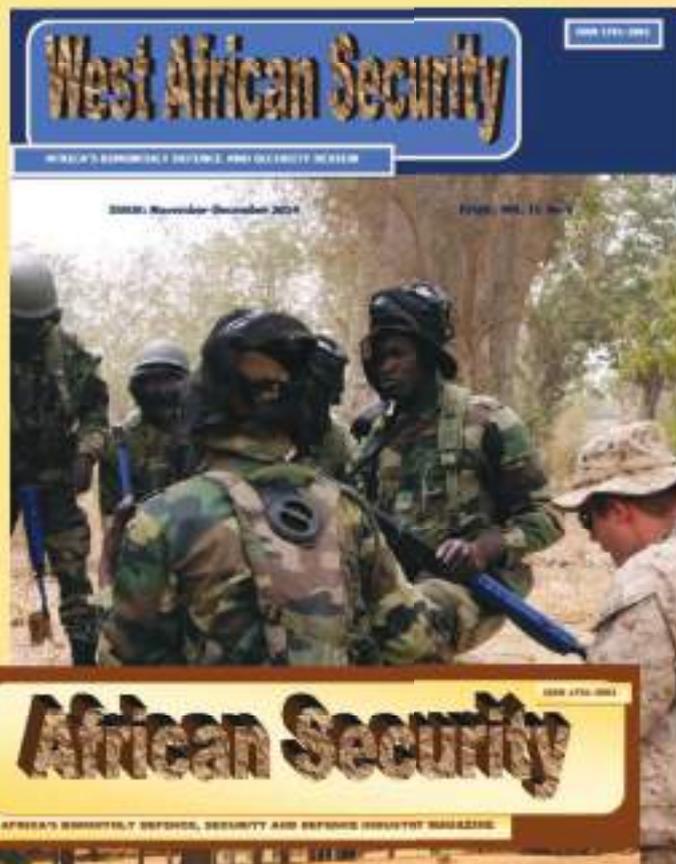
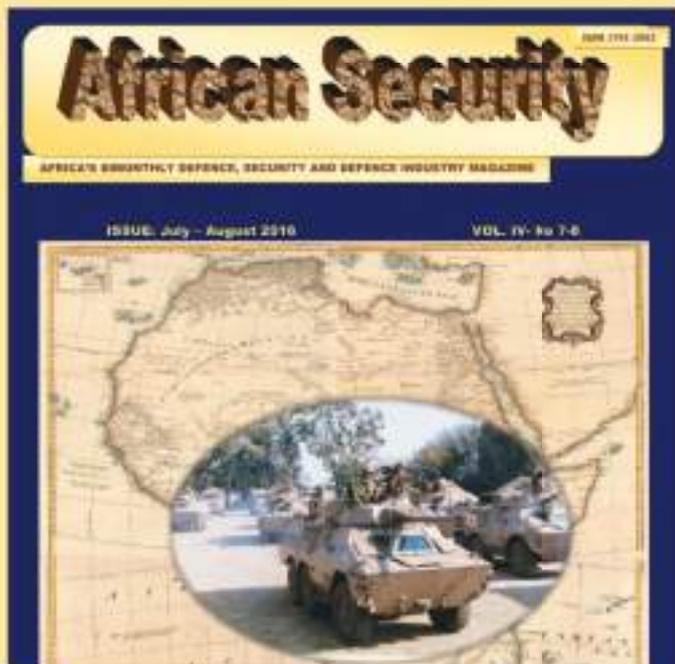
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