

ARMY MODERNIZATION:

The Push for
Soldier, Aircraft
and Vehicle
Defensive
Protection





Depiction of the Leonardo DRS TROPHY Active Protection System

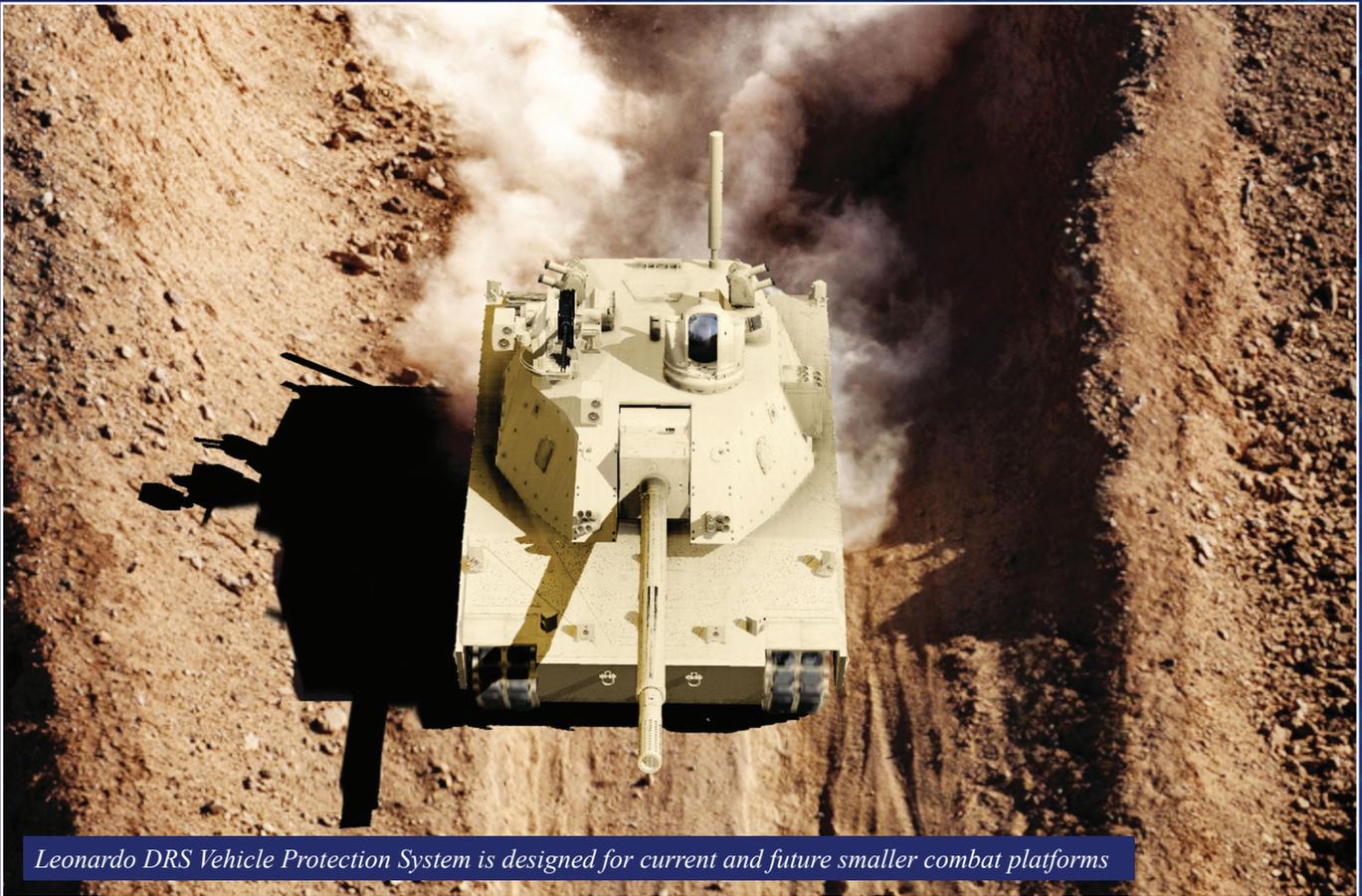
As the U.S. Army focuses on increased defensive protection for soldiers in its modernization effort, it looks to companies support its new requirements through innovative engineering and advanced technology. The modern battlefield has become a complex theater of threats, from powerful anti-armor and anti-aircraft missiles, to small but lethal unmanned aircraft that can quietly locate troops or swarm targets, to a variety of low-flying and heavily armed aircraft.

A recognized leader in defensive protection technologies, Leonardo DRS has successfully brought advanced programs like Trophy Active Protection Systems (APS), air defense systems, and electro-optical infrared weapon sights - among other technologies - that will protect soldiers from a range of growing advanced threats.

ARMOR DEFENSE

One of the first significant modernization programs the U.S. Army has undertaken is upgrading a number of brigades of M1A2 main battle tanks with an APS capability to counter increasingly lethal anti-armor threats on the battlefield. A highly mature APS already chosen by the U.S. Army for fielding is the Trophy system. Developed by the Israeli firm Rafael, Trophy is offered in the United States by Leonardo DRS.

But as smaller and more modern vehicles, like the Next-Generation Combat Vehicle, take shape – smaller and yet more comprehensive Vehicle Protection System (VPS) solutions will be required to shield them from an even wider array of threats. Enter the Trophy Vehicle Protection System (VPS). Leonardo DRS and Rafael have been qualifying this lighter-weight, yet equally effective, version of Trophy for lighter armored vehicles.



Leonardo DRS Vehicle Protection System is designed for current and future smaller combat platforms

“Trophy VPS is the logical next step in APS for smaller combat vehicles that require hard-kill threat defeat but are weight and space constrained,” said Aaron Hankins, senior vice president and general manager of the Leonardo DRS Land Systems business unit. “The system is 40% lighter than current systems but retains Trophy’s proven defeat performance. Most importantly, it provides the mature foundation for a broader, more holistic approach to vehicle protection,” he said.

Additionally, other Leonardo DRS protection technologies enabled by Trophy VPS add further layers of security for the vehicle and crew.

Hostile Fire Detection – Multi-spectral sensors employing modern detection

hardware and algorithms give users the ability to quickly identify the type and location of hostile fire and immediately react to protect the platform and engage the threat. In parallel, this threat data is automatically passed through the battle management network to alert friendly forces to the situation in near real-time.

Target Detection – Leonardo DRS technology detects enemy weapons prior to a hostile fire event. Using highly advanced optical technology, targets are located and identified by their optical signature. The technology senses a wide variety of threat weapons, whether hidden in complex urban landscapes or open terrain.



Hostile missile detection for small to medium airframes

AIRCRAFT DEFENSE

New aircraft-based defensive protection systems are being developed to counter exponentially growing heat-seeking anti-aircraft missile threats. A combination of electro-optical, infrared (EO/IR) and laser-based systems being tested are showing a great deal of promise for improving survivability for air crews when threatened by these missiles.

Leonardo DRS is a company with advanced laser and EO/IR systems designed to identify and counter these threats, including sensors to protect U.S. Army rotary wing aircraft as part of the new Limited Interim Missile Warning System, providing a foundation for the Army's future threat detection needs.

Leonardo DRS advanced laser systems are also gaining attention throughout the services for the ability to counter heat-seeking missile sensors and keep them away from helicopters with their industry leading quantum cascade laser technology.

“The Leonardo DRS quantum cascade laser-based countermeasure works in concert with our missile warning sensors to identify and cripple heat-seeking missile threats,” said Dr. Timothy Day, senior vice president and general manager of the Leonardo DRS Daylight Solutions business

unit. “The system is then able to confuse the missile and direct it safely away from the aircraft.”

The U.S. military plans to grow its helicopter fleet in the coming years, including development of the future vertical lift program. While the platforms will become increasingly sophisticated, older and improved anti-aircraft technology will still be a threat. Laser-based high-tech tools are available

now to upgrade the current fleets and can be incorporated into future platforms.

DEFEATING AIR THREATS

Mounted air defense capabilities for the U.S. Army to protect soldiers, large facilities and critical infrastructure from a variety of air threats are becoming a becoming reality for the service.

Mission equipment packages have been integrated on different tactical vehicles and combat platforms, providing the required protection from the ever-evolving air threats including small UAS, rotary wing and fixed wing aircraft. Solutions are capable of detecting, identifying, tracking and defeating a wide variety of threats. The capabilities include hard and soft kill options to defeat the threats.



IM-SHORAD (front) and Counter-UAS

Companies like Leonardo DRS are playing an important role in successfully developing, integrating, testing and delivering these mobile counter-UAS capabilities using teammate Moog's Reconfigurable Integrated-weapons Platform (RIWP®) turret with multiple kinetic effectors, different EO/IR sensors, on-board radar, and electronic warfare technologies.

The company has also moved quickly to answer the Army's request to field the Initial Maneuver Short-Range Air Defense (IM-SHORAD) capability to defeat larger UAS, rotary wing and fixed wing threats. Leonardo DRS provides the vital Mission Equipment Package (MEP) and works with its industry partner to integrate it on a purpose-built Stryker.

These mobile C-UAS and IM-SHORAD solutions have the mobility, firepower and protection necessary to move and maneuver within Brigade Combat Teams at the small-unit tactical level.

COMBAT COMPUTING

Multi-Domain Operations (MDO) is advancing warfighting by synchronizing data across air, space, sea, land, cyber and electromagnetic domains with revolutionary simplicity. The future of warfighting will require technology solutions that create seamless interoperability and strengthen joint operations in a range of contested environments.

New state-of-the-art ground combat networking technology will increase situational awareness in future conflicts.

The Mounted Family of Computer Systems II (MFOCS II), developed by Leonardo DRS, enables the next generation of computing and display technology with faster processing speeds and multi-function application capabilities. Additionally, MFOCS II has enhanced processing capabilities to enable Mounted



MFOCS II flexibility of use



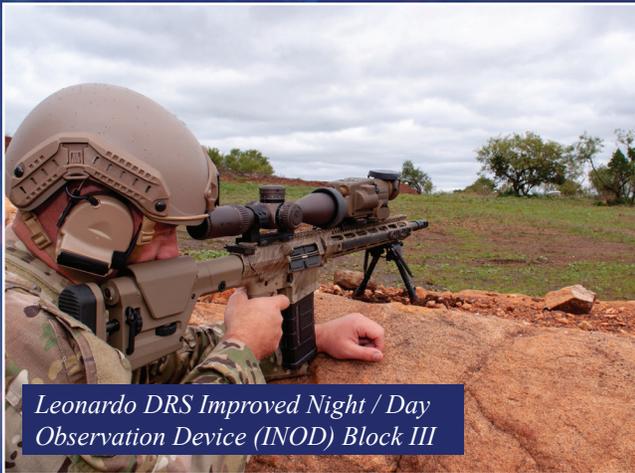
MFOCS II vehicle layout option

Common Operating Environment capability convergence as the vehicle network integrates multiple sensor inputs, internal and external communications and multiple current and future software applications.

MFOCS II computing hardware, which operates the next-generation JBC-P Battle Management System for situational awareness and position location as well as multiple current and future combat platform operating systems and applications, is a more powerful and updated system.

The U.S. Army began fielding MFOCS II systems in tactical ground combat vehicles in the U.S. Army and Marine Corps fleets in 2019 and will be available to allied nations around the world.

“The system is a direct response to U.S. Army requirements for a more networked, mobile, flexible, agile and integrated ground combat computing hardware system, with an enhanced capability for expeditionary missions across the full



Leonardo DRS Improved Night / Day Observation Device (INOD) Block III



Leonardo DRS Joint Effects Targeting System (JETS)

range of military operations,” said Bill Guyan, senior vice president and general manager of the Leonardo DRS Land Electronics business unit.

NEXT-GEN ELECTRO-OPTICAL AND INFRARED

The modernization of U.S. military ground forces has called for giving troops the most state-of-the-art EO/IR technologies available. Upgrading targeting sensors for combat vehicles provides new capabilities in weapon sights that can see at incredible ranges through the most difficult environmental conditions.

“Next-generation EO/IR technology is at the heart of the Army’s ground force modernization efforts,” said Jerry Hathaway, senior vice president and general manager of Leonardo DRS’s Electro-Optical & Infrared Systems (EOIS) business unit. “The need for troops to have access to this new state-of-the-art technology mounted on vehicles, helmets or handheld is essential to keep the edge over increasingly advanced adversaries around the world,” Hathaway said.

Leonardo DRS is providing advanced sensors for the new generation of Night Vision Goggles that are providing soldiers with technologies allowing users to see much more clearly through the toughest of environmental conditions than previous versions.

The company is also providing the Army with a new generation of the Family of Weapon Sights-Individual that not only provides incredibly clear thermal vision, but allows users to see what is in the sight wirelessly when connected to the new Enhanced Night Vision Goggle-B.

Leonardo DRS also produces and delivers a range of industry-leading advanced thermal targeting and surveillance sights for Army and Marine Corps combat vehicles, giving them an unprecedented level of sight through darkness, smoke, dust and other poor environmental conditions.

With over a half of a century pioneering infrared detector development, advanced sensor suites and robust targeting systems, Leonardo DRS has built a reputation for providing the innovative electro-optical and infrared systems that U.S. and allied military forces have come to rely on.

SUMMARY

Leonardo DRS has long been a leader and provider of advanced sensor technologies. The company recognized the needs for increased battlefield protection by the U.S. military and recognized its unique capabilities could deliver advanced soldier protection based on modernization efforts to create multiple platforms designed to offer maximum protection with the most advanced technology.