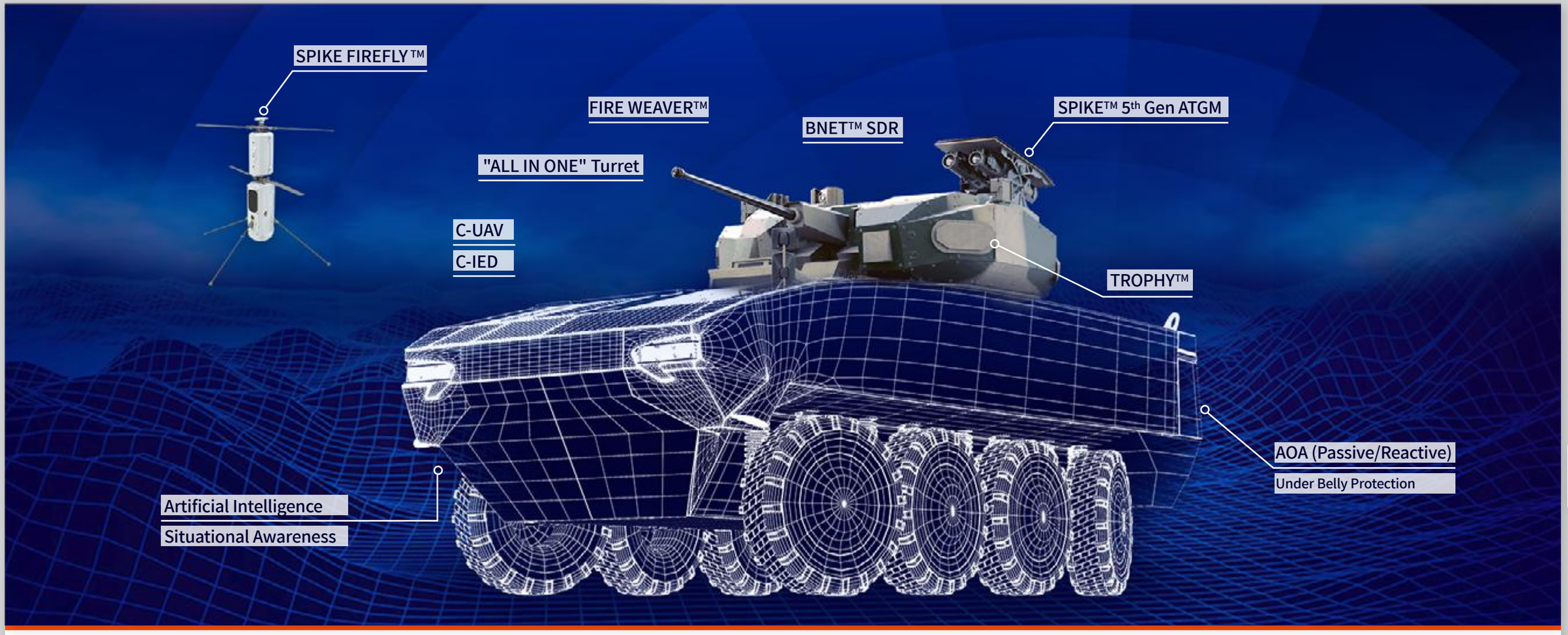
RAFAEL
ADVANCED DEFENSE SYSTEMS LTD.



Next Generation Combat Vehicle Suite - NGCV-S

From platform management to ultra - effective mission management

Combat vehicles need powerful defensive and offensive capabilities in order to ensure maximum lethality and high survivability, and to simultaneously neutralize multiple targets, while defending against a wide variety of threats. Most of today's armored vehicles are equipped with modern, advanced combat systems that provide both attack and intelligence gathering capabilities. However, these systems operate independently of each other, which prevents the utilization of their full collective potential. With over 72 years of experience and expertise in developing a wide variety of solutions, RAFAEL has turned individual systems into a single, fully integrated array, with all components operating simultaneously and in concert.

Based on this innovation, RAFAEL has developed the Next Generation Combat Vehicle Suite (NGCV-S), incorporating offensive and defensive measures, as well as upgraded AI capabilities and crucial situational awareness capabilities, shared among all involved troops.

Survivability

TROPHY™

With over 500,000 operational hours since 2011, TROPHY APS is the world's first operationally deployed and combat-proven active protection system. It is currently in use by the US Army and US Marine Corps on their Abrams M1 tanks as well as by the IDF on their main battle tanks (Merkava Mk.IV and Mk.III) and Namer heavy APCs.

Defending vehicles from anti-tank missiles, TROPHY rapidly detects, classifies, engages and neutralizes simultaneous, multi-directional threats approaching from various distances, and from high elevations. This combination of features makes TROPHY both a defensive and offensive system – providing the full range of cutting-edge capabilities required by vehicles in the modern battlefield. TROPHY's unparalleled level of protection enables the crew to focus on the critical processes of maneuvering, attack, and combat management – while secure in the knowledge that the system will neutralize every anti-tank threat from any range. The TROPHY APS is engineered for minimal collateral damage, which is essential for urban arenas. It has an exceptionally high success rate, both when stationary or on the move.

ARMOR SHIELD™ Family

The ARMOR SHIELD Family provides advanced Passive and Reactive add-on armor for combat vehicles. These combat-proven kits protect against a broad range of threats including kinetic energy projectiles, anti-tank shaped charges, high-speed fragments, improvised IEDs, RPGs and EFPs. Modular and easy to install or remove, they are lightweight, low-cost, and maintenance-free, and meet NATO environmental and safety standards. This low-weight, state-of-the-art armor – including STANAG Levels 5 & 6 – provides the strongest protection available today, without decreasing the vehicle's speed and maneuverability.

Lethality

SAMSON™ Family

The basic system is a 3rd generation, medium caliber RWS - in serial production - which benefits from all the latest improvements and maturation of RAFAEL's combat-tested and battle-proven SAMSON RWS systems. Designed to mount a 30/40 mm gun and a coaxial 7.62 mm machine gun, it can be integrated into a heavy, medium or light high-mobility fighting vehicle - whether new, existing, or upgraded. The system provides observation and target engagement capabilities with enhanced firing accuracy, and is fully integrated with RAFAEL's SPIKE missile dual launcher.

The system's main features include rapid location of the fire source and effective return fire; faster, more accurate slew-to-cue; life-saving under-armor ammunition loading and head-out option via an inherent hatch for situation awareness; integration with any BMS; and a unified user interface serving all subsystems.

SPIKE™ 5th Gen ATGM Missile Systems

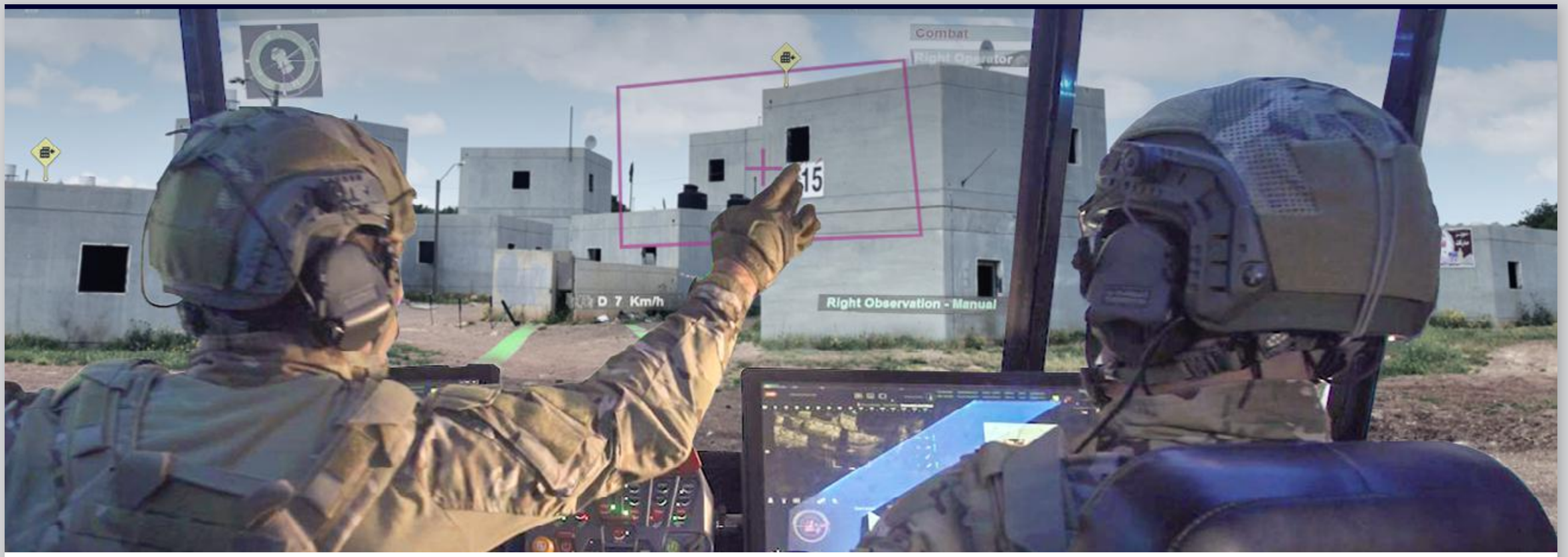
Designed for mid- and long-range attack, SPIKE LR2, ER2 and NLOS are RAFAEL's cutting-edge 5th generation multi-platform, multi-mission and multi-range electro-optical missiles for armored vehicles. With enhanced standoff ranges from 5.5km up to 32km, SPIKE missiles are able to eliminate static and moving targets, UAVs and bunkers in the open theater as well as in urban areas.

Combining the SPIKE missile system with the SAMSON Integrated 30 mm RWS and its combat management systems transforms the RWS and the vehicle into a versatile fighting machine – able to simultaneously neutralize targets at multiple ranges, with the pinpoint accuracy required in the urban arena as well as in GPS-denied zones. An RWS enhanced with the exceptional fire power and accuracy of SPIKE missiles provides an unprecedented level of self-defense, enabling the neutralization of threats at close range as well as at ranges of several kilometers, thus allowing safe combat and maneuvering.

SPIKE FIREFLY™

FIREFLY is a mini, portable, Beyond Line of Sight (BLOS) close-combat Loitering Munition (LM) system that meets the challenges faced by forces in urban combat: behind-cover enemies, limited situational awareness, and the close proximity of non-combatants. A member of the SPIKE Family, FIREFLY enhances force lethality and enables vehicles to dominate the urban battlespace with day/night precision engagement. FIREFLY can be launched either from within the vehicle or as part of the RWS, serving as an armed forward scout, eliminating threats on the vehicle's path. Multiple LMs can be launched in parallel, enabling simultaneous attacks on multiple targets. FIREFLY has a dual day/night seeker (IR/CMOS) and proximity sensors, a military-standard bidirectional data link, and a removable warhead compartment.

Battle Management



Situational Awareness

One of RAFAEL's main goals is to enable the crew to perform any kind of mission while remaining safe, under closed hatches. To achieve these goals, fighting vehicles and their crews must possess a high level of situational awareness. With RAFAEL's advanced computer vision technologies, the situational awareness capabilities of any combat vehicle crew can be enhanced, while using existing sensors and observation systems. A unique algorithm gathers and fuses data received from multiple sensors on the vehicle and from other external sources such as FIRE WEAVER. Together, it presents the crew with comprehensive augmented reality symbols – creating a common visual language – that provides real-time understanding of the complete battlefield picture, including enemy locations, blue force locations, points-of-interest, etc.

GPS-Denied Navigation

Based on RAFAEL's Computer Vision technologies, CT-MENTOR enables accurate navigation and self-localization for vehicles of any type and is especially effective for urban areas.

The system includes a SLAM algorithm which creates a cloud of points in the environment. Using a 3D model the system's unique technologies match the points to the model and provides an accurate location without deviation.

The system uses a small SWAP efficient form factor that can be integrated in any vehicle – from light automobiles and trucks to armored battle vehicles and tanks and even to a UGV.

Autonomous Mission Support

Based on Combat Artificial Intelligence, RAFAEL's Suite includes an internal brain, delivering autonomous mission support that increases lethality and survivability, by enabling effective decision-making, while reducing the cognitive burden of the crew. The Autonomous Mission Support can simultaneously manage and fully utilize the potential of all integrated systems, and enables a wide range of autonomous capabilities, including Mission Planning, Route Mapping, Automatic Target Recognition (ATR) and Detection, Autonomous Scanning and Autonomous Weapon Selection. The system's autonomy level can be defined by the crew at any moment. Thanks to its open architecture, the system can upgrade any existing or future platform and incorporate any sensor or shooter.

FIRE WEAVER™

Representing a major milestone in the launch of the combat vehicle into the digital age, FIRE WEAVER is a networked combat system with sophisticated autonomous capabilities that connects all sensors, shooters and the BMS in real-time. It instantly and simultaneously selects the optimal shooter for each target and closes unlimited "sensor-to-shooter" loops. Enabling network-wide situational awareness, the system generates a high-precision, GPS-independent, common visual language between the vehicle's crew and all battle participants – sharing live data such as targets, enemy and blue force locations and points of interest. By integrating FIRE WEAVER, the vehicle no longer works alone in the battlefield, but is now connected to all network participants.

BNET™ SDR

BNET is a next-generation ultra-high-speed broadband tactical, data/voice/video, software defined on-the-move radio. Based on patented Multi-frequency Channel Reception technology (MCR), it employs a Mobile Ad-Hoc Network (MANET) which is decentralized, hubless, self-forming, self-healing and multi-user. Globally field-proven, BNET enables comprehensive and effective situational awareness which, when combined with FIRE WEAVER, brings a true revolution to modern warfare. Scalable to up to a thousand users, the BNET SDR architecture is exceptionally flexible and can accommodate future applications and waveforms.

Optimized Capabilities - Maximized Interoperability

These breakthrough innovations ensure forces of an ongoing advantage by reshaping battlefields, enabling long-term endurance, and saving lives.

Working solely with a One-Stop-Shop – a single systems house such as RAFAEL – mitigates the risk, since all components as well as the entire integration process are the work of a single source.

This makes the integration faster, smoother, less complicated, and less costly, and enables optimized capabilities and maximized interoperability. It also allows customers to acquire ready-made systems that are integrable with future systems.

RAFAEL
LAND & NAVAL SYSTEMS DIVISION

Tel: +(972)73-335-2002
Fax: +(972)73-335-4093
Email: lnd-mkt@rafael.co.il

HQ **Tel:** +(972)73-335-4714
Fax: +(972)73-335-4657
Email: Intl-mkt@rafael.co.il

www.rafael.co.il

UNC. 64623-0920/8D/V1 ENG/Graphic Design Dep/042