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INTERNATIONAL ARMOURED VEHICLES

23-26 January 2023 • Twickenham Stadium, London

THE WORLD'S PREMIER MEETING GROUND FOR THE ARMOURED VEHICLES COMMUNITY

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AGENDA AT A GLANCE

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CONFERENCE CHAIRMAN

General Sir Adrian Bradshaw, KCB, OBE, DL
Deputy Supreme Allied Commander Europe (2014-2017)
Chairman, International Armoured Vehicles (2018-Present)

Gen. Bradshaw's career in armour extends back to when he joined the Army in 1980, going on to command the King's Royal Hussars, first at the UK Armoured Training Area in Alberta, Canada, and then as Battlegroup Commander in Bosnia. On promotion to BG, he went to 3rd (US) Army, planning for Land operations in Iraq. He then became Deputy Commander of US Task Force West before Commanding the UK 7th Armoured Brigade in Iraq. In Mar 09, he took command of 1st (UK) Armoured Division. He became Deputy Commander of ISAF in late 2011 and Commander UK Land Forces in Jan 2013. Gen. Bradshaw served as DSACEUR from Mar 2014 to Mar 2017.

CHAIRMAN'S WELCOME

Dear Friends and Colleagues,

I am delighted to welcome you to the 23rd annual International Armoured Vehicles (IAVs) Conference in London. This annual conference has gained a reputation as one of the world's premier international meeting grounds for military practitioners, research and development colleagues, as well as our partners and providers in industry.

Naturally, Ukraine will be at the forefront of people's minds and how nations can ensure they have the armoured capability to address potential peerthreats. Conflict in Ukraine has demonstrated the enduring importance of armour in land warfare in order to create the opportunity for manoeuvre, but also how using armour in poorly planned and coordinated operations, without the correct logistics and support from infantry and aviation, and without sophisticated Defensive Aids Suites on individual vehicles, can lead to heavy losses in the face of an enterprising foe equipped with man-portable top-attack anti-tank munitions supported by armed and reconnaissance drones and good communications.

As war in Ukraine continues to rage, and NATO member nations and others consider how to enhance deterrence, our IAVs 2023 conference will provide a unique opportunity for the armoured community to engage in productive, faceto-face discussions with allies employing armoured vehicles in widely varied operations around the world, and to learn about and see some of the latest vehicles and technology.

Discussion topics for 2023 will include all aspects of capability development, force generation, operations, and support. The upcoming event will seek to address two key questions: how can current platforms deliver more capability in this fast-changing environment, and how must platforms evolve to effectively protect against future threats?

IAVs 2023 will be fun, interesting, and informative, as well as an outstanding opportunity to network. I very much look forward to meeting you over the next few days.

General Sir Adrian Bradshaw, KCB, OBE, DL
Deputy Supreme Allied Commander Europe (2014-2017)
Chairman, International Armoured Vehicles (2018-Present)

2023 SPEAKERS

General Sir Patrick Sanders KCB CBE DSO ADC Gen, Chief of the General Staff, **British Army**

General Valério Stumpf Trindade, Chief of Army Staff, **Brazilian Army**

Lieutenant General Romulusz Ruszin-Szendi, Commander, **Hungarian Defence Forces**

Lieutenant General Erik C. Peterson, Deputy Chief of Staff for Programs, **U.S. Army**

Lieutenant General Sharon P.M. Nesmith, Deputy Chief of the General Staff, **British Army**

Lieutenant General John Kolasheski, Commanding General, **US Army V Corps**

Lieutenant General Sir Ralph William Wooddisse, KCB, CBE, MC, Commander Field Army, **British Army**

Lieutenant General Sir C. Roland V. Walker KCB DSO, Deputy Chief of the Defence Staff (Military Strategy and Operations), **U.K. Ministry of Defence**

Lieutenant General Richard Wardlaw, Chief of Defence Logistics and Support, **U.K. Strategic Command**

Chris Bushell, Director General Land, DE&S, **U.K. Ministry of Defence**

Lieutenant General Syed Aamer Raza, HI(M), Chairman Heavy Industry Taxila (HIT), **Pakistan Army**

Lieutenant General (Retd) Richard Nugee, Climate Change and Sustainability Non-Executive Director, **U.K. Ministry of Defence**

Major General Karl Engelbrektson, Commander, **Swedish Army**

Major General Veiko-Vello Palm, Deputy Commander, **Estonian Defence Forces**

Major General Cristian-Daniel Dan, Deputy Chief of Land Forces Headquarters, **Romanian Armed Forces**

Major General Pierre Gérard, Commander, Land Component, **Belgian Armed Forces**

Major General Glenn Dean, PEO, Ground Combat Systems (GCS), **U.S. Army**

Major General Curtis A. Buzzard, Commanding General, **United States Army Maneuver Center of Excellence**

Major General Darren Werner, Commanding General**, U.S. Army Tank-automotive and Armaments Command**

Major General Francesco Olla, Head of III Department (Military Policy and Planning), **Italian Army**

Major General Salvatore ANNIGLIATO, Chief of the Army Logistics Department, **Italian Army**

Major General Damien De Marsac, Deputy Chief of Staff, Plans & Programs, **French Ministry of Defence**

Major General Gianluca Carai, Deputy Commander, **NATO Allied Rapid Reaction Corps**

Major General S. Idris, Commander, Nigeria Army Armoured Corps(NAAC), **Nigerian Army**

James Gavin, Head, Future Capabilities Group, DE&S, **U.K. Ministry of Defence**

Roddy Malone, Head Industry & International, LEOC, **DE&S – UK MoD**

Brigadier Nick Cowey, MBE, Head Military Capability Delivery, Programmes Directorate, **British Army**

Brigadier General Holger Draber, Chief of the Strategic Capability Development Division (Planning II), **Bundeswehr**

Brigadier General Mark Clingan USMC, Assistant Deputy Commandant to CD&I, DCG, **Marine Corps Combat Development Command**

Brigadier General Francisco Romero, Head of Weapons Systems Procurement Subdirectorate (MALE),**Spanish Army**

Brigadier General (Ret.) Didi Ben-Yoash, Team Leader, Future Combat Vehicle, **Israel Ministry of Defence**

Michael Sprang, Project Manager, JPO JLTV, **U.S. Army**

Chris Bowbrick, SRO Armour Main Battle Tank Programme (Challenger 3), **British Army HQ**

Martyn Williams ChPP CEng, SRO Mechanised Infantry Programme & Director Boxer Strategic Pipeline, **British Army HQ**

Colonel Armin Dirks, Head of Operations, Combined Project Team of the Main Ground Combat System, **BAAINBw - Bundeswehr**

Colonel Daisuke SAKASEGAWA, Chief, 3rd Development Section, Ground Systems Development Division, **ATLA - Japan MOD**

Colonel Juhana Skyttä, Inspector, **Finnish Infantry**

Colonel Timothy Hough, PM Advanced Amphibious Assault, PEO Land Systems, **U.S. Marine Corps**

Colonel Pete Cowell, AH Tech Design Authority, LEOC, **DE&S – UK MOD**

Colonel (US Army) Timothy Wright, Future Force Development Army Futures, **British Army**

Lieutenant Colonel Ryan Pearce, Project Manager – Boxer CRV Recon, Land 400-2, **Australian Defence Force**

Lieutenant Colonel Brennan Speakes, Commander, 1-7 CAV, 1ABCT, 1CD, **United States Army**

2023 SPEAKERS

Lieutenant Colonel James de St John-Pryce, Commanding Officer, Armoured Trials and Development Unit, **British Army**

Lieutenant Colonel Martijn Hadicke, Head of Development and Innovation RAS-Program, **Royal Netherlands Army**

Lieutenant Colonel Matthew W Hohl, Mobility/Counter-Mobility Branch Head, Capabilities Development Directorate, **U.S. Marine Corps**

Lieutenant Colonel Masaki OIWA, Senior Officer, 3rd Development Section,Ground Systems Development Division, **ATLA - Japan MOD**

Marc Nuijten, BOXER System Group Manager, **NATO Support and Procurement Agency (NSPA)**

Major Mark Foster REME, SO2 Equipment Support Capability Development, **British Army**

Major Marc W. Jason, Armor Threat Integration, Foreign Intelligence Technology (DAMI-FIT), Army G-2, **U.S. Army**

Regine Friedberger, BOXER Programme Manager, **OCCAR**

Dr William Suttie, Land Platforms Group, Platform Systems Division, **Dstl - U.K. Ministry of Defence**

Tom Newbery CPhys, Platform Survivability Group, **Dstl, U.K. Ministry of Defence**

Captain Vladimir Melnikov, Deputy Project Director, Director Land Requirements, **Canadian Army Headquarters**

Dr. Sarah Ashbridge, Research Fellow in Military Science, **RUSI**

Major General (Ret.) Robert Talbot Rice, Former Director Land Equipment (2016-2018), **UK MOD**

Ted Maciuba, Former Deputy Director, Robotics Requirements, Maneuver CDID, **US Army Retired**

Brigadier (retired) Ben Barry OBE, Senior Fellow for Land Warfare, **International Institute for Strategic Studies**

Christopher F Foss, Armoured Vehicles Author and Journalist, **Consultant**

Emre AKIN, Strategic Planning and Market Development Director, **Nurol Makina**

Richard Allen-Miles, International Business Development – Defence Sector, **MOOG**

Rory Breen, Strategy and Future Business Director, **RBSL**

Lilian Cantuern, Manager of Engineering for Defense applications, **Meritor Defense**

David Chambers, Regional Sales Director Europe, **Nexter Systems**

Stefan Fontanari, Senior Vice President Sales Marketing, **Krauss-Maffei Wegmann**

Dr. David Gershon, Senior System Engineer, **Rafael Advanced Defense Systems Ltd.**

Christoffer Gregers Glæsel, Managing Director, **Glaucus**

Stefan Haase, Head of Product Unit Active Protection Systems, **Rheinmetall Protection Systems**

Col (Retired) Nick Hunter, Business Development and Sales, **Rheinmetall MAN Military Vehicles UK**

Christoph Jehn, Project Manager, **FFG**

Maj Gen (US Army Ret.) Pete Johnson, Vice President of Business Development for Integrated Vehicles, **GM Defense**

Dan Kalfus, Managing Director Company, **EuroTrophy GmbH**

Alex Koers, Co-Founder/Director, **Microflown AVISA**

Martin Krona, President of EMEA, **Markforged**

Jukka Lemola, Product Manager, Military Systems, **Patria**

Dan Lindell, Director Combat Vehicles, **BAE Systems Hägglunds**

Benjamin Lindsay, Senior Manager, Sales & Project Development, **FFG**

Stefan Lischka, Managing Director, **ARTEC GmbH**

Colonel (Ret.) Alan M. Mosher, Senior Director Strategic Campaigns and Planning, **DRS Land Electronics**

Lauri Pauniaho, Director, Weapon Systems, **Patria**

David Phalippon, Director of Sales, **Meritor Defense**

Rami Sokolower, Senior Director Land, **Elbit Systems Ltd**

Colonel (Ret.) James Teo,, Vice President, International Business, **ST Engineering Land Systems**

Onur Töreci, Marketing Professional, **Aselsan**

Mr. Hugo Vanbockryck, Senior Vice President Market Area Europe, **Patria**

Mr. Jean Vandel, Managing Director Defence, **TEXELIS**

Andrew Walker, Business Development Manager Land Systems Division, **Kongsberg Defence & Aerospace AS**

Michal Wermuth, Head of Land Autonomous Systems Product line, **Rafael Advanced Defense Systems**

Graeme Wilcock, Business Development Executive, **RENK VMS Division**

Bertie Williams, Business Development Executive, **Horstman**

Colonel (Ret.) Donald Wols, Business Development Director, **Glaucus ApS**

DAY ONE: MONDAY 23 JANUARY

0700	MORNING REGISTRATION AND NETWORKING COFFEE	
	PROTECTION AND SURVIVABILITY **Location: CHURCHILL SUITE**	**MOBILITY AND ELECTRIFICATION** **Location: ELGAR SUITE**
0745	**DEFENCE iQ WELCOME ADDRESS** **Alexander Stephenson,** Divisional Director, **Defence iQ**	**DEFENCE iQ WELCOME ADDRESS** **Alexander Stephenson,** Divisional Director, **Defence iQ**
0755	**CHAIR'S OPENING REMARKS: PROTECTION AND SURVIVABILITY SESSIONS** **Christopher F Foss,** Armoured Vehicles Author and Journalist**, Consultant**	**CHAIR'S OPENING REMARKS: MOBILITY AND ELECTRIFICATION SESSIONS** **Major General (Ret.) Robert Talbot Rice,** Former Director Land Equipment (2016-2018), **UK MOD**
0800	**OPENING KEYNOTE: MODERNISATION OF ESTONIAN ARMOURED CAPABILITY** • Adapting to a new strategic environment: State of security in Eastern Europe • Role of armoured vehicles in addressing current and future security challenges • Building up heavy infantry capability • Training and cooperation • National Defence Development Plan **Major General Veiko-Vello Palm,** Deputy Commander, **Estonian Defence Forces**	**OPENING KEYNOTE: THE SPANISH 8X8 ARMOURED FIGHTING VEHICLE (AFV) PROGRAMME** • Background & current status • Spanish 8x8 AFV: features and specifications • "Dragón" as the Spanish Army Force 35 spearhead • "Dragon" as a catalyst for the predictive logistics model and a key part of the Army logistics base project • Way ahead **Brigadier General Francisco Javier Romero Mari,** Head of Weapons Systems Procurement Subdirectorate,(MALE), **Spanish Army**
0830	**TROPHY APS – MATURING WITH EVOLVING THREATS** • TROPHY Active Protection System (APS) • Ease of integrating onto European Platforms • Advantages of battleproven APS **Dan Kalfus,** Managing Director Company, **EuroTrophy GmbH**	**ENHANCING OPERATIONAL CAPABILITY OF LAND FORCES THROUGH EMISSIONS-FREE TACTICAL ELECTRIFICATION** • Leveraging commercial electrification solutions • Operational advantages of a more electric battlefield • Hybrid-electric as a bridge to all-electric • Future approaches in tactical fast charging • Challenge and opportunity of re-shaping the logistics enterprise • Accelerating learning through tactical electrification pilots **Maj Gen (US Army Ret.) Pete Johnson,** Vice President of Business Development for Integrated Vehicles, **GM Defense**
0900	**FORCE PROTECTION FOR THE ARMOURED FIGHT: FROM OBSERVATION TO THE CLOSE FIGHT** • Discussing threat effects on blue forces as they maneuver to the objective • Threat UAS, reconnaissance and weaponized • ATGM systems • Threat armor and munitions **Major Marc Jason,** Armor Threat Integration, Foreign Intelligence Technology, G-2, **U.S. Army**	**EXPLOITING ELECTRIC DRIVE TO ENHANCE PLATFORM PERFORMANCE** • Research and development activities: Overview of previous studies • TD6 technology demonstration activities • Future exploitation of electric drive **Dr William Suttie,** Land Platforms Group, Platform Systems Division, **Dstl - U.K. Ministry of Defence** **Lieutenant Colonel James de St John-Pryce,** CO ATDU, **British Army**

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The RIwP® (Reconfigurable Integrated-weapons Platform) allows users to rapidly change weapons (both direct and indirect fire) to achieve tailored overmatch against evolving threats. This proven, affordable, and innovative weapon system provides maximum lethality across multi-domains and is both vehicle and weapon agnostic. The mission adaptable RIwP also provides best-in-class soldier protection and firing accuracy.

Join us in the lethality stream briefing room on Tuesday, 24 January at 14:30 for a presentation on RIwP's unique suitability for CUAS, air defence, and anti-armour roles.

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0930

CASTLE ACOUSTIC SUBARRAY FOR IMPROVING VEHICLE SURVIVABILITY

- CASTLE hardware
- Detection of incoming direct fires
- Collaborative protection

Alex Koers, Co-Founder/Director, **Microflown AVISA**

PROTECTION THROUGH MOBILITY

- Modernisation of mobility systems via modularity and incremental upgrade paths
- Digital design as an enabler of technology
- Electrification solutions for wheeled and tracked vehicles
- Digitisation of mobility and networked powertrains

Bertie Williams, Business Development Executive, **Horstman**

Graeme Wilcock, Business Development Executive, **RENK VMS Division**

1000 **MORNING COFFEE AND NETWORKING**

	PROTECTION AND SURVIVABILITY Location: CHURCHILL SUITE	MOBILITY AND ELECTRIFICATION Location: ELGAR SUITE

1030	**LEVERAGING TEAMING TECHNOLOGIES TO BOOST COMBAT EFFECTIVENESS OF ARMORED VEHICLES**
	• Enhancing vehicles performance and situational awareness using drones
	• MUM-T of a vehicle and UAVs/UGVs - mission planning and execution
	• Multi-platform management technologies – dilemmas and solutions
	• Successfully dealing with time critical targets and larger enemy forces
	
	Michal Wermuth, Head of Land Autonomous Systems Product line, **Rafael Advanced Defense Systems**
		COST EFFICIENT - MODULAR DRIVELINE CONCEPT
		• Intro - Cummins-Meritor
		• Field proven solutions
		• Cost effective modular approach
		  ○ All wheel drive tactical trucks
		  ○ All wheel drive high mobility armoured vehicles
		  ○ All kinds of military mission profiles
		• Customisation for packaging and performance optimisation
		• Prepared for low emissions requirements (gas, noise, thermal) and the electrification of the driveline
		
		David Phalippon, Director of Sales, **Meritor Defense**
		
		Lilian Cantuern, Manager of Engineering for Defense applications, **Meritor Defense**

1100	**ACHIEVEMENTS AND FUTURE AMBITIONS IN RESEARCH & DEVELOPMENT OF ARMORED VEHICLES IN JAPAN** **Colonel Daisuke SAKASEGAWA,** Chief, 3rd Development Section, Ground Systems Development Division, Acquisition, Technology and Logistics Agency (ATLA), **Japan Ministry of Defence**	**ELECTRIFICATION OF US ARMY LIGHT TACTICAL VEHICLES** • Pursued/planned efforts • Expected benefits • Technical/operational considerations **Michael Sprang,** Project Manager, JPO JLTV, **U.S. Army**
1130	**SUPERIOR SURVIVABILITY & MISSION EFFECTIVENESS AT VARIOUS THREAT ENVIRONMENTS** • Providing operational superiority and high resilience in the face of the most aggressive and asymmetric threats • Ejder Yalcin 4x4 and NMS 4X4: superior survivability: mine protection, ballistic protection, protection against lateral blasts and IED • Modular design and Multi Role Vehicles: Enabling users to cover special operations including combat operations, indirect fire support, transportation of troops and equipment, command and control, medevac, air defense, and reconnaissance. **Emre AKIN,** Strategic Planning and Market Development Director, **Nurol Makina**	**ARMOURED COMBAT SUPPORT VEHICLE G5 & ARMOURED RECOVERY MODULE BOXER** • Dedicated support vehicle from conception • Armoured formation support swiss army knife • Modular, highly mobile workhorse • Force multiplier on tracks **Benjamin Lindsay**, Senior Manager, Sales & Project Development, **FFG** **Christoph Jehn,** Project Manager, **FFG**

	PROTECTION AND SURVIVABILITY Location: CHURCHILL SUITE	MOBILITY AND ELECTRIFICATION Location: ELGAR SUITE
1200	**PANEL DISCUSSION: ENHANCING ARMOURED VEHICLE SURVIVABILITY IN CURRENT AND FUTURE COMBAT ENVIRONMENTS** • What characterises current and likely future operating environment? How does armoured capability need to adapt to this? • What is the current role of armour in urban conflict? What will its role be on the future urban battlefield? • Maintaining freedom of manoeuvre, enhancing tank survivability, and adapting tank firepower for combat operations **Moderated by:** **Christopher F Foss,** Armoured Vehicles Author and Journalist**, Consultant** **Participants:** **Colonel Timothy Hough,** Program Manager Advanced Amphibious Assault, Program Executive Officer Land Systems, **U.S. Marine Corps** **Lieutenant Colonel Matthew W Hohl,** Mobility/Counter-Mobility Branch Head, Capabilities Development Directorate, **U.S. Marine Corps** **Major Marc Jason,** Armor Threat Integration, Foreign Intelligence Technology, G-2, **U.S. Army**	**PANEL DISCUSSION: ELECTRIFICATION** • Key outcomes from TD6 and other technology demonstrators • How to buy, try, and overcome hurdles to then scale and operate innovative equipment • GVA, standardization and SWAP-C benefits of operating at different voltages • Novel capability opportunities by transitioning to full EV manned/optionally manned vehicles **Moderated by:** **Major General (Ret.) Robert Talbot Rice,** Former Director Land Equipment (2016-2018), **UK MOD** **Participants:** **Colonel Pete Cowell,** AH Tech Design Authority, LEOC**, DE&S – UK MOD** **Dr William Suttie,** Land Platforms Group, Platform Systems Division, **Dstl – UK MOD** **Lieutenant Colonel James de St John-Pryce,** CO Armoured Trials and Development Unit, **British Army** **Michael Sprang,** Project Manager, JPO JLTV, **U.S. Army**
1230	**LUNCH AND NETWORKING**	
1330	**THE STRATEGIC PARTNERSHIP WITH FRANCE, CAMO** • Background • Current situation • Way Ahead **Major General Pierre Gérard,** Commander, Land Component, **Belgian Armed Forces**	**OCCAR PERSPECTIVE – NEXT GENERATION MULTI ROLE ARMOURED VEHICLES** • Ensuring maximum strategic and tactical mobility in a wide range of operational scenarios • Balancing capabilities: Transport capacity, mobility, protection, survivability, growth potential and efficient life cycle costs • Current and future developments **Regine Friedberger,** BOXER Programme Manager, **OCCAR**
1400	**ACCOMPLISH YOUR MISSION: NOW AND IN THE FUTURE** • Protection of armoured vehicles from UAV threats • Autonomical solutions (HUGV, Drive-by-wire) • Related through-life capability services **Jukka Lemola,** Product Manager, Military Systems, **Patria**	**BOXER - DELIVERING THE BRITISH ARMY LAND INDUSTRY STRATEGY – AN INDUSTRY VIEW** • Development of a British Army capability – industrial capability • Delivering the Boxer programme in the UK • Delivering a UK supply chain • Delivering UK skills **Rory Breen,** Strategy and Future Business Director**, RBSL**
1430	**ENHANCING SURVIVABILITY FOR THE CONTESTED BATTLESPACE** • Current inventory and update on Romanian Armed Forces current procurements • Operational specification and requirements for the incoming fleet • Achieving interoperability and conducting training exercises at NATO standards **Major General Cristian-Daniel Dan**, Deputy Chief of Land Forces Headquarters, **Romanian Armed Forces**	**NSPA PERSPECTIVE ON BOXER PROGRAMME** **Marc Nuijten,** BOXER System Group Manager, **NATO Support and Procurement Agency (NSPA)**

1500

HYBRID PROTECTION (ACTIVE / PASSIVE) FOR ARMORED VEHICLES

Stefan Haase, Head of Product Unit Active Protection Systems, **Rheinmetall Protection Systems**

BOXER - THE FAMILY IS GROWING

- Introducing new members of the vehicle family
- growth in production capabilities to cope with the demand

Stefan Lischka, Managing Director, **ARTEC GmbH**

1530

MOBILITY AND ELECTRIFICATION
Location: ELGAR SUITE

PANEL DISCUSSION: BOXER

- Developing a common logistics approach for the boxer fleet
- Modularity of the vehicle and variations for each nation
- Challenges of common logistics across a family of vehicle variations
- Future developments and future variations, how they are funded

Participants:

Regine Friedberger, BOXER Programme Manager, **OCCAR**

Stefan Lischka, Managing Director, **ARTEC GmbH**

Marc Nuijten, BOXER System Group Manager, **NATO Support and Procurement Agency (NSPA)**

Martyn Williams ChPP CEng, SRO Mechanised Infantry Programme & Director Boxer Strategic Pipeline, **British Army HQ**

Lieutenant Colonel Ryan Pearce, Project Manager – Boxer CRV Recon, Land 400-2, **Australian Defence Force**

1600 **AFTERNOON COFFEE AND NETWORKING**

	PROTECTION AND SURVIVABILITY Location: CHURCHILL SUITE	MOBILITY AND ELECTRIFICATION Location: ELGAR SUITE
1630	**DEPLOYING ARMOURED RESOURCES TO COUNTER NIGERIA'S CONTEMPORARY AND FUTURE SECURITY CHALLENGES** • Combating Asymmetric Threats with Armoured Resources. • Successfully Leveraging Tank Fires to Counter Dispersed Force Structures. • Integrating Highly Mobile Armoured Capability in Asymmetric Operations **Major General S. Idris,** Commander, Nigeria Army Armoured Corps(NAAC), **Nigerian Army**	**ACHIEVEMENTS AND FUTURE AMBITIONS IN RESEARCH & DEVELOPMENT OF ARMORED VEHICLES IN JAPAN** **Colonel Daisuke SAKASEGAWA,** Chief, 3rd Development Section, Ground Systems Development Division, Acquisition, Technology and Logistics Agency (ATLA), **Japan Ministry of Defence**
1700	**IRON FIST – OPEN AND MODULAR ACTIVE PROTECTION FOR INTEGRATED SURVIVABILITY** **Rami Sokolower,** Senior Director Land, **Elbit Systems Ltd**,	**AUTONOMIZATION OF MILITARY WHEELED VEHICLES** **Mr. Jean Vandel** Managing Director Defence, **TEXELIS**
1730	**TANK AL KALID – 1** • Introduction to HIT. • Projects underway. • Prospective Projects. • Desired collaborations **Lieutenant General Syed Aamer Raza, HI(M),** Chairman Heavy Industry Taxila (HIT), **Pakistan Army**	**BENEFITS OF A MULTINATIONAL ARMOURED VEHICLE PLATFORM** • Update on plans to develop a common armoured vehicle platform with Patria and Latvia • Understanding the benefits of a multinational armoured vehicle platform: Interoperability, maintenance, logistics, and training solutions **Colonel Juhana Skyttä,** Inspector, **Finnish Infantry**

	PROTECTION AND SURVIVABILITY Location: CHURCHILL SUITE	MOBILITY AND ELECTRIFICATION Location: ELGAR SUITE
1800	**CLOSING PANEL DISCUSSION: PROTECTION AND SURVIVABILITY** • Do we understand the full potential of APS for armoured vehicles? • How will APS be operated in the future? • Are current attempts to standardize APS in accordance with this and realizing their potential – does it help or not? • Rocket Propelled Grenade (RPG) protection Vs. Active Protection Systems (APS) • Soft kill vs Hard kill – different systems available and trade-offs; what are the effects on nearby infantry? **Participants:** **Brigadier (Ret.) Ben Barry OBE,** Senior Fellow for Land Warfare, **IISS** **Tom Newbery CPhys,** Platform Survivability Group, **Dstl - U.K. Ministry of Defence** **Rami Sokolower,** Senior Director Land, **Elbit Systems Ltd**,	**CLOSING PANEL DISCUSSION: MOBILITY** • Crossing the gap: Bridge-laying, fascines and novel gap-crossing capabilities - coping with future heavy armour • Wheels Vs. Tracks – all terrain capabilities and logistical trains; trade-offs and Wheeled options for heavy armoured engineering vehicles • Deployability as well as manoeuvrability; how quickly can vehicles arrive at the fight? **Moderated by:** **Major General (Ret.) Robert Talbot Rice,** Former Director Land Equipment (2016-2018), **UK MOD** **Participants:** **Colonel Juhana Skyttä,** Inspector, **Finnish Infantry** **Richard Beatson,** Business Development Director, **Pearson**
1830	**CHAIR'S SUMMARY REMARKS: PROTECTION AND SURVIVABILITY SESSIONS** **Christopher F Foss,** Armoured Vehicles Author and Journalist**, Consultant**	**CHAIR'S SUMMARY REMARKS: MOBILITY AND ELECTRIFICATION SESSIONS** **Major General (Ret.) Robert Talbot Rice,** Former Director Land Equipment (2016-2018), **UK MOD**
	ICE-BREAKING DRINKS RECEPTION HOSTED BY LEONARDO DRS IN THE SHAKESPEARE SUITE	
1845	**ICE-BREAKING DRINKS RECEPTION HOSTED BY LEONARDO** LEONARDO DRS	*All conference participants are invited to the official conference drinks reception hosted by LEONARDO DRS and held in the Shakespeare Suite exhibition hall.*

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23 - 26 JANUARY, 2023

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DAY TWO: TUESDAY 24 JANUARY

0700	**MORNING REGISTRATION AND NETWORKING COFFEE**
	IDENTIFYING LESSONS FROM CURRENT CONFLICTS **Location: LIVE ROOM**
0800	**DEFENCE iQ WELCOME REMARKS** **Alexander Stephenson,** Divisional Director, **Defence iQ**
0805	**CHAIR'S OPENING REMARKS** **General Sir Adrian Bradshaw, KCB, OBE, DL,** Former DSACEUR (2014-2017), **International Armoured Vehicles 2023 Conference Chair**
0815	**HOW UK MILITARY STRATEGY IS ADAPTING TO CONTEMPORARY CONFLICT** **Lieutenant General Sir C. Roland V. Walker KCB DSO,** Deputy Chief of the Defence Staff (Military Strategy and Operations), **U.K. Ministry of Defence**
0845	**U.S. ARMY MANEUVER CENTRE OF EXCELLENCE: COMMANDER'S PRIORITIES** **Major General Curtis A. Buzzard**, Commanding General, **United States Army Maneuver Center of Excellence**
0915	**PANEL DISCUSSION: LESSONS IDENTIFIED FROM CONTEMPORARY CONFLICTS** • What lessons can we identify from recent conflicts? How vulnerable are AVs on the modern battlefield? • Does new technology and the rise of unmanned aerial vehicles, pose a significant challenge? • How will nations adapt their training to enhance readiness for similar conflict scenarios? • How does the successful deployment of consumable, non-line of sight anti-tank weapons influence the combined arms team today and into the future? • What lessons can we draw from the deployment of advanced deception systems in Ukraine? Is deception more applicable than ever against anti armoured and precision fires threats? **Moderated by:** **General Sir Adrian Bradshaw, KCB, OBE, DL,** Former DSACEUR (2014-2017), **International Armoured Vehicles 2023 Conference Chair** **Participants:** **Lieutenant General Sir C. Roland V. Walker KCB DSO,** Deputy Chief of the Defence Staff (Military Strategy and Operations), **U.K. Ministry of Defence** **Major General Curtis A. Buzzard**, Commanding General, **United States Army Maneuver Center of Excellence** **Dan Lindell,** Director Combat Vehicles, **BAE Systems Hägglunds** **Brigadier (Ret.) Ben Barry OBE,** *Senior Fellow for Land Warfare,* **IISS**
1000	**HOW THE BRITISH ARMY WILL FIGHT** **Lieutenant General Sir Ralph William Wooddisse, KCB, CBE, MC,** Commander Field Army, **British Army**
1030	**MORNING COFFEE AND NETWORKING**
1100	**ARMOURED VEHICLES ROLE IN A MULTIDOMAIN JOINT OPERATION – A SWEDISH VIEW** **Major General Karl Engelbrektson,** Commander Swedish Army, **Swedish Armed Forces**
1130	**HOW CV90 BECAME THE NUMBER ONE CHOICE FOR NATO** • How to stay relevant over decades • Ensuring vehicles have an outstanding pedigree of reliability, durability and high system availability • Designing modern configurable vehicles which are ready for future growth: Military applications, Humanitarian Aid Disaster Relief, Fire Fighting and Rescue operations • Leveraging commercial automotive technologies and ergonomic **Dan Lindell,** Director Combat Vehicles, **BAE Systems Hägglunds**

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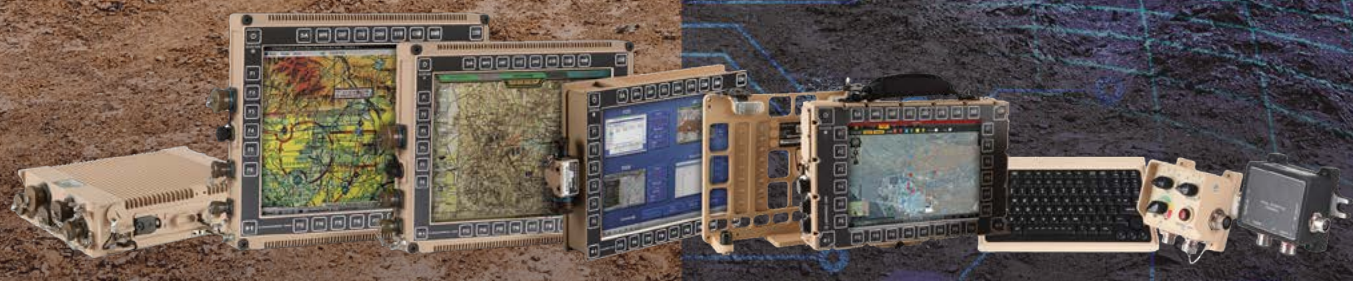

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1200 **MODERNISING THE BRITISH ARMY**

Lieutenant General Sharon P.M. Nesmith, Deputy Chief of the General Staff, **British Army**

1230 **PANEL DISCUSSION: ENHANCING READINESS IN EUROPE**

- Challenges with existing training events in Europe including multinational communication
- Initiatives to develop a persistent training environment in Europe
- An interoperable training environment to further readiness and interoperability within European Land Forces
- The use of technology for distributed training
- Adapting the multinational training environment into a multinational operational one as required

Moderated by:

General Sir Adrian Bradshaw, KCB, OBE, DL, Former DSACEUR (2014-2017), **International Armoured Vehicles 2023 Conference Chair**

Participants:

Lieutenant General John Kolasheski, Commanding General, **US Army V Corps**

Major General Cristian-Daniel Dan, Deputy Chief of Land Forces, **Romanian Armed Forces**

Major General Gianluca Carai, Deputy Commander**, NATO Allied Rapid Reaction Corps**

1300 **LUNCH AND NETWORKING**

	LOGISTICS AND MAINTENANCE Location: ELGAR SUITE	FIREPOWER AND LETHALITY Location: LIVE ROOM
	SESSION CHAIR **Major General (Ret) Robert Talbot Rice,** Former Director Land Equipment (2016-2018), **UK MOD**	**SESSION CHAIR** **General Sir Adrian Bradshaw, KCB, OBE, DL,** Former DSACEUR (2014-2017)
1400	**DEFENCE SUPPORT STRATEGY - SECURING THE U.K. DEFENCE SUPPLY CHAIN** • Diagnosis: Current state of the Defence Support Function including underlying reasons for challenges and opportunities • 15-year vision: Building on existing Defence operating concepts including Multi Domain Integration • Strategic Outcomes by 2025 **Lieutenant General Richard Wardlaw,** Chief of Defence Logistics and Support, **U.K. Strategic Command**	**CHALLENGES OF "ZEITENWENDE": THE FUTURE OF BUNDESWEHR'S ARMOURED LAND COMBAT SYSTEMS** • Principles of Bundeswehr's Special Fund • NATO-Demand and DEU Contribution • Medium Forces • Selected Project Status Updates • Modernization/Upgrade Leopard Fleet – bridging the Gap to Main Ground Combat System **Brigadier General Holger Draber,** Chief of the Strategic Capability Development Division (Planning II), **Bundeswehr**
1430	**FORWARD REPAIR SYSTEM NATO M/22 (FRSN M/22)** • Versatile multitool for repair and maintenance of combat vehicles • Lessons learned from supporting nations across the NATO-alliance • New M/22-version highlights and improvements **Christoffer Gregers Glæsel,** Managing Director, **Glaucus**	**RIWP - ONE PLATFORM, MULTIPLE ROLES** How RIwP: • addresses current threats AND ensures tailored overmatch against new and emerging threats • gives options not available from competitive weapons platforms • achieves these whilst offering 85% hardware commonality, lower logistics and training burden • Plans for local RIwP manufacture / Moog's UK footprint **Richard Allen-Miles**, International Business Development – Defence Sector, **MOOG**

1500

ADVANCED MANUFACTURING: EQUIPMENT SUPPORT FOR CONTINGENCY OPERATIONS

- Equipment Support – enduring principles and the case for modernisation
- Challenges to the integration of Advanced Manufacturing technology
- Experimentation – recent successes and the future plan

Major Mark Foster REME, SO2 Equipment Support Capability Development, **British Army**

CARMEL - MUM FUTURE MULTIDIMENSIONAL MANEUVER

- CARMEL program overview
- Simulations initial outcomes and conclusions
- Way Ahead

Brigadier General (Ret.) Didi Ben-Yoash, Team Leader, Future Combat Vehicle, **Israel Ministry of Defence**

Yvonne Avitov, Operations and Control Manager Future Main Combat Vehicle Team, **Israel Ministry of Defense**

1530

MOBILE 3D PRINTERS IN THE FIELD!

- Advantages of Additive Manufacturing for deployed forces; from initial design to 3D printed component in the field
- Case studies of activity with the US Military and the British Army
- Overview of printer capabilities and their different applications
- How to scale AM adoption across armed forces

Martin Krona, President of EMEA, **Markforged**

PROTECTOR REMOTE WEAPON SYSTEMS: INCREASING MISSION SUCCESS

- Manned Un-Manned Teaming (MUM-T) and levels of Autonomy
- PROTECTOR - Countering the Unmanned Aircraft System threat
- Increasing effector capabilities and providing broader operator lethality choice

Andrew Walker, Business Development Manager Land Systems Division, **Kongsberg Defence & Aerospace AS**

1600 **AFTERNOON COFFEE AND NETWORKING**

1630

PANEL DISCUSSION: MANAGING THE LOGISTICAL FOOTPRINT

- Forward deploying the logistics and support infrastructure in a contested theatre
- Maintaining and sustaining dispersed armoured units and improving capacity for self-sustaining armoured forces
- Reducing the logistical footprint: battle damage repair vs. system recovery base, self-diagnostics, modularising components
- Game-changing technologies and how technology, such as AM, can cause us to rethink logistics and maintenance
- Denied to the enemy: recovery vs. destruction

Moderated by:

Major General (Ret) Robert Talbot Rice, Former Director Land Equipment (2016-2018), **UK MOD**

Participants:

Lieutenant General Richard Wardlaw, Chief of Defence Logistics and Sup port, **U.K. Strategic Command**

Major General Darren Werner, Commanding General, **U.S. Army Tank-automotive and Armaments Command**

Major General Salvatore ANNIGLIATO, Chief of the Army Logistics Department, **Italian Army**

Colonel (Ret.) Donald Wols, Business Development Director**, Glaucus ApS**

Martin Krona, President of EMEA, **Markforged**

PATRIA NEMO: SUPERIOR LETHALITY AND SURVIVABILITY

Lethality components

- Fire On the Move; multiple platforms
- Rate of fire – at the target: MRSI
- Rapid response; Time to shoot
- Close combat; Direct Fire + RWS
- Connectability: BMS, Sensor network

Survivability through unique features

- Full platform protection; NBC, IED, snipers
- Constant movement
- Crew fatigue diminished

To survive is to fight again

Lauri Pauniaho, Director, Weapon Systems, **Patria**

1700

PANEL DISCUSSION: FIREPOWER AND LETHALITY

- How does the anticipated hybrid, evolving nature of future conflict necessitate use of launch platforms allowing constant reconfiguration of effectors?
- To what extent is the ability to host the widest variety of effectors, particularly Missiles, now the main differentiator between weapons platforms?
- From the user perspective, how can the manufacturers of weapons platforms meet this challenge?

Participants:

Major General Francesco Olla, Head of III Department (Military Policy and Planning), **Italian Army**

Chris Bowbrick, SRO Armour Main Battle Tank Programme (Challenger 3), **British Army HQ**

Brigadier General (Ret.) Didi Ben-Yoash, Team Leader, Future Combat Vehicle, **Israel Ministry of Defence**

Colonel Armin Dirks, Head of Operations, Combined Project Team of the Main Ground Combat System, **BAAINBw - Bundeswehr**

1730	**RETURN TO PLENARY IN THE LIVE ROOM: 10-MINUTE TRANSITION TIME**	
1740	**HUNGARIAN APPROACH TO IMPROVING ARMOURED AND MECHANISED CAPABILITY** **Lieutenant General Romulusz Ruszin-Szendi,** Commander, **Hungarian Defence Forces**	

1810	**POLAND M1A2SEPV3 FORMATIONS C5I INTEGRATION, PROTECTION, AND SURVIVABILITY**
	• Fully Integrated, Modular, and Scalable Mobile C5I System
	  ○ Network, hardware, and software applications that are agnostic, modular, expandable, and GVA compliant for legacy, emerging, and future equipped armoured formations
	  ○ Based on US Army Program of Record MFoCS II product line
	• Cyber capabilities as integral part of C5I capability
	  ○ Secure Provisioning. Secure BIOS. Secure Boot. Self-Encrypting Drive
	• Scalable Assured – Position, Navigation, and Timing (A-PNT) capability
	  ○ Operate in GPS denied multi domain battle environment now
	• SitaWare Frontline Battle Management System (BMS) Software
	• Poland M1A2Sepv3 Formations Enhanced Protection and Survivability
	
	Colonel (Ret.) Alan M. Mosher, Senior Director, International Strategy, **DRS Land Electronics**	

1840	**DAY ONE CLOSING KEYNOTE: NEW STRATEGIC PROJECTS OF THE BRAZILIAN ARMED FORCES** **General Valério Stumpf Trindade,** Chief of Army Staff, **Brazilian Army**	
1910	**CHAIR'S SUMMARY REMARKS** **General Sir Adrian Bradshaw, KCB, OBE, DL,** Former DSACEUR (2014-2017), **Conference Chair**	
1915	**DRINKS RECEPTION** HOSTED BY RUAG IN THE ROSE SUITE RUAG	*All conference participants are invited to the official conference drinks reception hosted by RUAG and held in the Rose Suite exhibition hall*
2000	**BY INVITATION ONLY: GALA DINNER** HOSTED BY DEFENCE iQ Defence iQ **Dress code:** Service Uniform or Business Attire	*With a capacity of 200, the gala dinner is a seated event by invitation only.* *Invited Guests will enjoy a three-course meal and evening entertainment***.**

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Cook Defence Systems is the world's leading independent designer and manufacturer of track systems for armoured fighting vehicles.

British-made Cook tracks are battle-proven on thousands of fighting vehicles all over the world, and have been chosen by global defence contractors for the most modern vehicles currently under development or in production.

Mobility

Fighting vehicles must manoeuvre over the toughest terrain, in the harshest conditions. Cook's lightweight steel tracks offer battle-winning aggression and mobility in the most hostile environments.

Quality

Cook track links are cast in high-specification alloy steel, heat-treated for strength. Every single link is tested to verify its mechanical properties, and x-rayed to guarantee its soundness. Out of over two million links made since 2000, not one has failed in service due to a manufacturing defect.

Durability

Cook tracks have replaceable rubber road pads and resilient rubber bushes to reduce noise and vibration. The rubber compounds result from decades of laboratory tests and vehicle trials. Their durability means Cook tracks last longer, and vehicle crews spend less time changing tracks or pads.

Reliability

Cook tracks are designed to minimize the maintenance burden on vehicle crews, with time-saving features such as slide-in road pads and 'fit-and-forget' *Fastlock* connectors. All track maintenance can be performed by the crew, in the field, with no need for lifting equipment, power or hydraulics.

Commitment

Cook tracks are manufactured by 130 skilled employees in the North of England, and hundreds more in the company's UK supply chain. Every one of them is proud to keep the British Army and its allies ready for a real fight, against a peer adversary, anywhere in the world.

www.william-cook.co.uk

DAY THREE: WEDNESDAY 25 JANUARY

0700	**MORNING REGISTRATION AND NETWORKING COFFEE**
	Location: LIVE ROOM
0750	**CHAIR'S OPENING REMARKS** **General Sir Adrian Bradshaw, KCB, OBE, DL,** Former DSACEUR (2014-2017), **International Armoured Vehicles 2023 Conference Chair**
0800	**OPENING KEYNOTE: MODERNISATION AND THE STRATEGIC AND FISCAL ENVIRONMENT** **Lieutenant General Erik C. Peterson,** Deputy Chief of Staff for Programs, **U.S. Army**
0830	**ACTIVE PROTECTION AND THE FUTURE OF SURVIVABILITY FOR ARMOURED VEHICLES** • The use of Active Protection System on armoured vehicles • ASELSAN's indigenous approach for Active Protection & Survivability • The journey of development & verification on active protection • The future and the road map for next generation systems **Onur Töreci,** Marketing Professional, **Aselsan**
0900	**DEFENCE AND MILITARY ADAPTATION TO CLIMATE CHANGE: THE U.K.'S NEW STRATEGY** • Reacting to the effect that climate change is having on armies' ability to operate • Capitalising on novel technologies that enhance or retain capability in a changed environment, and reduce emissions where feasibly possible • From now on, for every single piece of equipment that we buy, one question that must be answered is: What is the impact of this piece of equipment on the environment and what could we do to make it better? **Lieutenant General (Retd) Richard Nugee,** Climate Change and Sustainability Non-Executive Director, **U.K. Ministry of Defence**
0930	**PANEL DISCUSSION: IMPACT OF CLIMATE CHANGE ON ARMIES AND ARMOURED VEHICLES** *By 2030, carbon neutral targets and commitments will make it increasingly difficult, expensive and/or politically challenging to operate ICE in Europe. How will this affect future procurement of fighting vehicles?* • What technologies are manufacturers developing? • Is there a trade-off between environmental credentials and operational effectiveness? • Harnessing green technologies for military advantage - What additional capability can tactical and combat vehicle electrification bring? • Will operating ICE technology at the tactical edge remain possible in 2040+? • How do we best communicate climate change initiatives within the Defence Enterprise? **Moderated by:** **Lieutenant General (Retd) Richard Nugee,** Climate Change and Sustainability Non-Executive Director, **U.K. Ministry of Defence** **Participants:** **Lieutenant General Richard Wardlaw,** Chief of Defence Logistics and Support, **U.K. Strategic Command** **Dr William Suttie,** Land Platforms Group, Platform Systems Division, **Dstl - U.K. Ministry of Defence** **Dr Sarah Ashbridge,** Research Fellow in Military Science, **RUSI**
1000	**HOST NATION KEYNOTE ADDRESS: CHIEF OF THE GENERAL STAFF** **General Sir Patrick Sanders KCB CBE DSO ADC Gen,** Chief of the General Staff, **British Army**
1030	**MORNING COFFEE AND NETWORKING**

MAJOR VEHICLE PROCUREMENTS AND CAPABILITY UPGRADES

1100 **FLEETS AND FAMINE**

How to ensure a genuine through-life approach to the British Army's vehicle fleet?

Brigadier Nick Cowey MBE, Head of Military Capability Delivery, **British Army**

1130 **CURRENT AND FUTURE DELIVERY FOR THE U.K.'S ARMOURED FORCES**

Chris Bushell, Director General Land, DE&S, **U.K. Ministry of Defence**

1200 **DIGITALISED FORCES – ENSURING OVERMATCH AGAINST FUTURE THREATS**

- Advantages of digitalisation and how it enhances precision manoeuvres and fires
- ST Engineering's comprehensive approach to the digital transformation of land forces
- ST Engineering's 5G On-the-Move Concept, enabling forces to move in a bubble for greater lethality and survivability

Colonel (Ret.) James Teo, Vice President, International Business, **ST Engineering Land Systems**

1230 **INDUSTRY LEADERS' PANEL DISCUSSION: THE IMPACT OF UKRAINE ON SUPPLY CHAINS AND COMMERCIAL BEHAVIOUR**

- How has Ukraine affected your supply industrial sub-chains? [prices, availability?]
- Has Ukraine affected your choice of suppliers and if so what changes is this forcing across industry?
- How are you seeing Governments and customers react? What would help you if you were to suggest a change of approach what would it be?
- Will Ukraine on top of the recent pandemic change the way you bid for contracts in future (risk pricing etc)

Moderated by:

Roddy Malone, Head Industry & International, LEOC, **DE&S – UK MoD**

Participants:

Mr. Hugo Vanbockryck, Senior Vice President Market Area Europe, **Patria**

Rory Breen, Strategy and Future Business Director, **Rheinmetall BAE Systems Land (RBSL)**

Dan Lindell, Director Combat Vehicles, **BAE Systems Hägglunds**

Stefan Fontanari, Senior Vice President Sales Marketing, **Krauss-Maffei Wegmann (KMW)**

1315 **LUNCH AND NETWORKING**

1415 **IMPLICATIONS OF UKRAINE ON ARMY MODERNISATION**

- Re-envisioning land warfare with Next Generation Combat Vehicles
- Pressing on with NGCV: Next steps and the way ahead

Major General Glenn Dean, PEO, Ground Combat Systems (GCS), **U.S. Army**

1500 **DISTRIBUTED NETWORKED WEAPON STATIONS FOR C-UAS**

- The need: C-UAS scenarios for armoured vehicles
- Adding C-UAS to a single platform: challenges, solutions and impacts
- Leveraging the network: improved C-UAS capability with less effort

Dr. David Gershon, Senior System Engineer, **Rafael Advanced Defense Systems Ltd**

1530 **FRENCH ARMY CAPABILITY MODERNISATION**

Major General Damien de Marsac, Deputy Chief of Staff, Plans & Programs, **French Ministry of Defence**

1600 **NEXTER JAGUAR ARMOURED RECONNAISSANCE VEHICLE**

David Chambers, Regional Sales Director Europe, **Nexter Systems**

1630 **AFTERNOON COFFEE AND NETWORKING**

1700 **ITALIAN ARMY VEHICLE CAPABILITY**

Major General Francesco Olla, Head of III Department (Military Policy and Planning), **Italian Army**

1730 **LATEST DEVELOPMENTS WITH THE MARINE CORPS' FORCE DESIGN**

- Amphibious Combat Vehicle (ACV)
- Future Advanced Reconnaissance Vehicle (ARV)

Brigadier General Mark Clingan USMC, Assistant Deputy Commandant to CD&I, DCG**, Marine Corps Combat Development Command**

1800 **CHAIR'S SUMMARY REMARKS**

General Sir Adrian Bradshaw, KCB, OBE, DL, Former DSACEUR (2014-2017), **International Armoured Vehicles 2023 Conference Chair**

1815 **SESSIONS END**

DAY FOUR: THURSDAY 26 JANUARY

0800	**MORNING REGISTRATION AND NETWORKING COFFEE**
	ROBOTICS AND HUMAN MACHINE TEAMS **Location: ELGAR SUITE**
0850	**CHAIR'S OPENING REMARKS**  **Ted Maciuba,** Former Deputy Director, Robotics Requirements, Maneuver CDID, **US Army Retired**
0900	**UK OPPORTUNITIES AND THE EXPLORATION OF REMOTE AUTONOMOUS SYSTEMS IN THE LAND SYSTEM ENVIRONMENT** • Who the UK MOD DES FCG team are in terms of the wider UK MOD innovation ecosystem • FCG areas of focus for capability exploration for the UK Front Line Commands • Opportunities and competition  **James Gavin,** Future Capability Group Head, DE&S, **U.K. Ministry of Defence**
0930	**OPERATIONALISING COMBAT UNMANNED GROUND VEHICLES** • Lessons identified from a 3-month deployment of Combat UGVs as part of the NATO Enhanced Forward Presence • Operationalizing robotic and autonomous systems in support of Multi-Domain Operations  **Lieutenant Colonel Martijn Hadicke**, Head of Development and Innovation RAS-Program, **Royal Netherlands Army**
1000	**MORNING COFFEE AND NETWORKING**
1030	**MAIN GROUND COMBAT SYSTEM: ROBOTICS AND AUTOMATIZATION ON PLATFORM AND SYSTEM LEVEL** • Innovation for an essential increase of automatization of on-board process steps • Manned-Unmanned Teaming comprising aerial and ground platforms • Guaranteeing assertiveness and superiority by significantly enlarging effective ranges for SDRI and firepower  **Colonel Armin Dirks,** Head of Operations, Combined Project Team of the Main Ground Combat System, **BAAINBw - Bundeswehr**

1100	**MODERN CONFLICT: LEARNING FROM EXPERIENCE, A RHEINMETALL VIEW**
	• The ongoing conflict in Ukraine represents the greatest "strategic shock" in Europe since the end of the Cold War, and ushers in a new "contested" world view.
	• The implications are far reaching for international alliances, defence industry, supply chains, national military structures and capabilities.
	• This presentation will discuss:
	  ○ The Rheinmetall view of the lessons from these events, giving an industrial perspective and illustrate how industry must alter its' posture to meet the new challenges
	  ○ How Rheinmetall is meeting the challenge in harnessing future technological trends to meet the global demands and the evolving security context
	RHEINMETALL
	Colonel (Ret.) Nick Hunter, Head of Business Development, **Rheinmetall Defence UK**

1130	**UPDATE ON CANADIAN ARMY UGV REQUIREMENTS**  **Captain Vladimir Melnikov,** Deputy Project Director, Director Land Requirements, **Canadian Army Headquarters**
1145	**BRITISH ARMY HUMAN MACHINE TEAMING PROJECT**  **Colonel (US Army) Timothy Wright**, Future Force Development, Army Futures, **British Army**

1200

PANEL DISCUSSION: HUMAN-MACHINE TEAMING AND CHANGING THE WAY WE FIGHT

- Broadly, how do you see unmanned platforms and RAS transforming the battlefield-in the next 5, 10 and 20 years? What do you see as the biggest roadblocks/main challenges for fielding different types of UGVs and UAVs in the near-term?
- How can industry support the rapid delivery of unmanned and autonomous technologies?
- The ethical question and communicating the realities of robotic combat vehicles
- The optimal construct of a human-machine team (HMT) and building trust in HMT

Moderated by:

Ted Maciuba, Former Deputy Director, Robotics Requirements, Maneuver CDID, **US Army Retired**

Participants:

Colonel Armin Dirks, Head of Operations, Combined Project Team of the Main Ground Combat System, **BAAINBw - Bundeswehr**

Colonel (US Army) Timothy Wright, Future Force Development, Army Futures, **British Army**

Lieutenant Colonel Brennan Speakes, Commander, 1-7 CAV, 1ABCT, 1CD, **United States Army**

Lieutenant Colonel Martijn Hadicke, Head of Development and Innovation RAS-Program, **Royal Netherlands Army**

Captain Vladimir Melnikov, Deputy Project Director, Director Land Requirements, **Canadian Army Headquarters**

1245 **LUNCH AND NETWORKING**

1345

Each Interactive Discussion Group will invite participants to discuss the proposed topic. Participants will circulate among multiple roundtables as the discussions proceed. At the close of the session, each group leader will spend approximately 3-5 minutes summarizing key takeaways from the discussions in front of the audience.

APPLICATIONS OF UNMANNED AERIAL VEHICLES ON THE FUTURE BATTLEFIELD

Ted Maciuba, *Former Deputy Director, Robotics Requirements, Maneuver CDID,* **US Army Retired**

THE OPTIMAL CONSTRUCT OF A HUMAN-MACHINE TEAM

INTEGRATION WITH INDUSTRY, ALLIES AND PARTNERS TO BOOST COLLECTIVE COMBAT POWER

Colonel Armin Dirks, Head of Operations, Combined Project Team of the Main Ground Combat System, **BAAINBw - Bundeswehr**

MATURING CONCEPTS INTO CAPABILITY: ITERATIVE CONCEPT DEVELOPMENT AND EXPERIMENTATION

Lieutenant Colonel Martijn Hadicke, Head of Development and Innovation RAS-Program, **Royal Netherlands Army**

IDENTIFYING MISSION SETS FOR ROBOTIC COMBAT VEHICLES

OPERATIONALISING COMBAT UNMANNED GROUND VEHICLES

1445 **ROUNDTABLE LEADERS SUMMARISE KEY TAKEAWAYS TO THE GROUP**

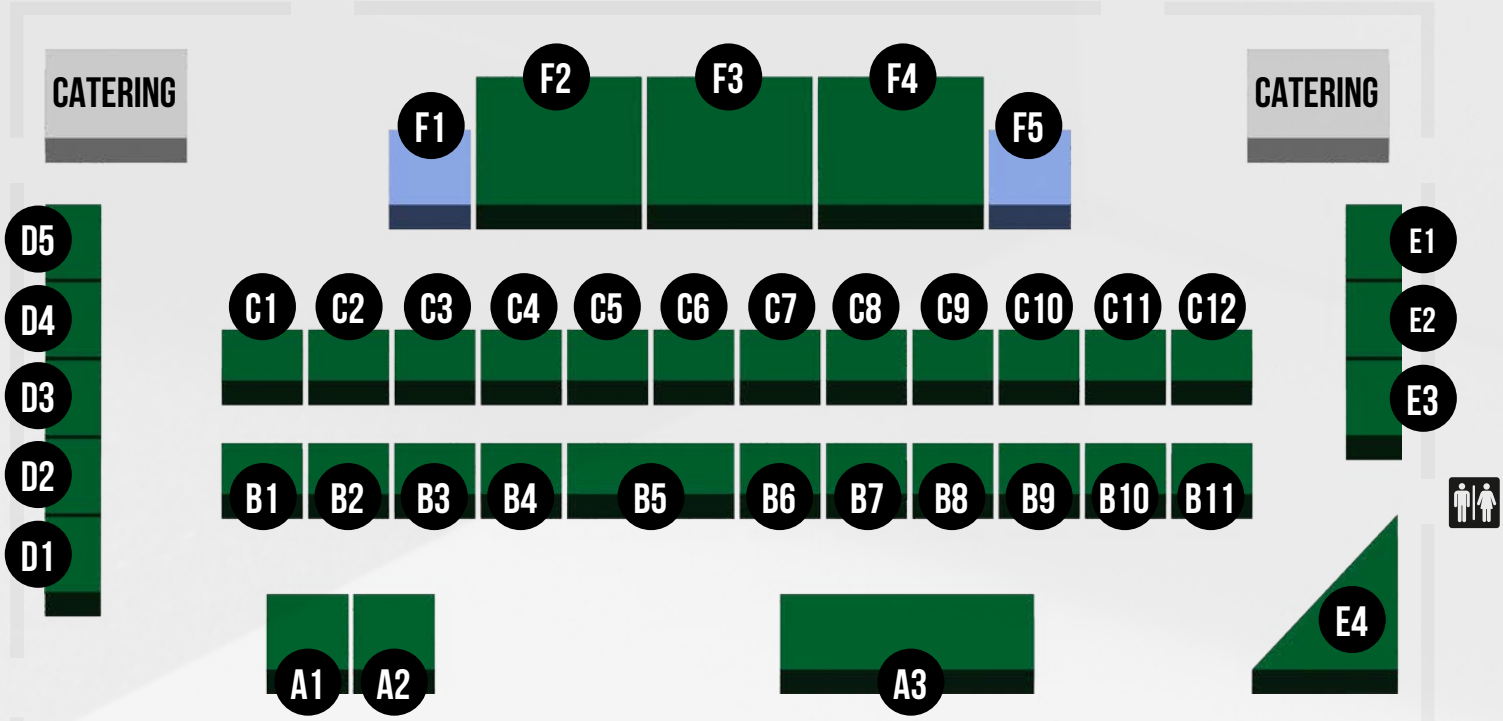
1500 **CHAIR'S SUMMARY REMARKS**

Ted Maciuba, Former Deputy Director, Robotics Requirements, Maneuver CDID, **US Army Retired**

1515 **CLOSE OF CONFERENCE**

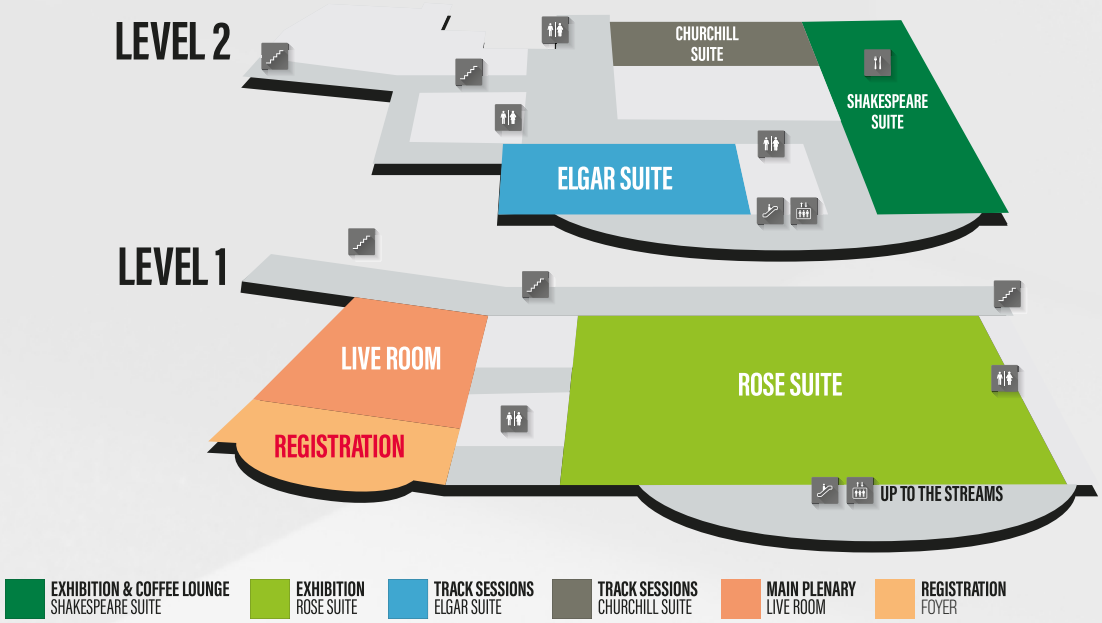
2023 FLOORPLAN

EXHIBITION LEVEL 1

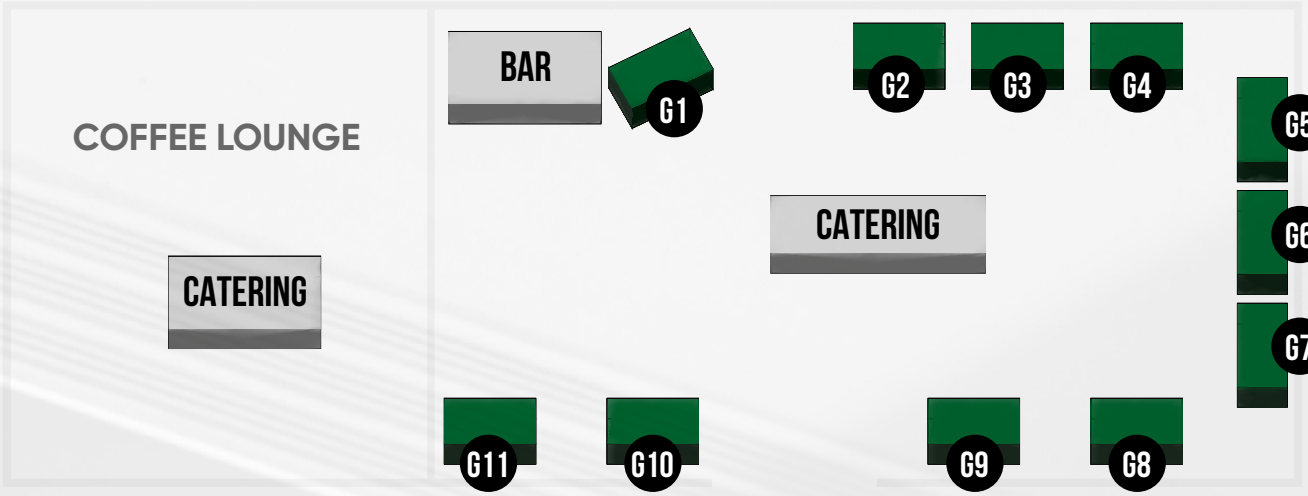


ARTEC	D2	Environics	E3	John Cockerill	B7	Nexter	C7	SAFT	B3
Aselsan	F3	FFG	C4	Kappa Optronics	B11	NVTS	C12	ScioTeq	E2
British Army	E4	FT Technologies	D4	Kongsberg	C5	Patria	C3	Skydex	B8
Carter Bearings	D1	Glaucus	D5	Leonardo DRS	F2	Pearson Engineering	A2	Soucy	C9
CES	B4	IDV (IVECO)	A3	Markforged	B9	Rafael	F4	ST Engineering	C1
CTA	C2	INKAS	B5	Microflown AVISA	E1	RBSL	D3	Texelis	B6
Defence iQ	F5	Innalabs	C11	Moog	F1	Rocketsan	B10	Ultra	C8
DST	A1	INVISIO	C10	NBC-SYS	B1	Ruag	B2	VRAI	C6

VENUE MAP



EXHIBITION LEVEL 2



Aselsan	G2	Cook Defence Systems	G1	Gaardtech	G8	Michelin	G10
ATDU	G11	DB Santasalo	G5	Horstman	G9	Nurol Makina	G7
BI Simulations	G3	ESUK	G6	Meritor	G4		

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Website: https://www.army.mod.uk/

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ASELSAN utilizes technological know-now, skills and expertise accumulated from a heritage relying on ethical values in line with its motto, "Technology serving People and Planet".

Website: http://www.aselsan.com.tr

IDV, a brand of Iveco Group, is dedicated to delivering innovative automotive and protection solutions to meet the needs of military customers worldwide. The company manufactures specialist logistic, protected, and armoured vehicles in its facility in Bolzano (Northern Italy) and markets as well Iveco's full commercial range, adapted as necessary to meet the demands of the military user. In consequence, IDV has a full range of vehicles to meet a broad spectrum of defence applications.

Website: https://www.idvgroup.com/

Leonardo develops multi-domain capabilities in the Aerospace, Defence and Security sector. The company plays a prominent role in major international strategic programmes and is a trusted technological partner of governments, defence agencies, institutions and enterprises. Innovation, continuous research, digital manufacturing and sustainability are the cornerstones of Leonardo's business worldwide.

Website: https://www.leonardodrs.com/

Patria is a global defence, security and aviation company providing life cycle support services, pilot training and technology solutions. Its aerospace and military customers Patria provides equipment availability, continuous performance development as well as selected intelligence, surveillance and management system products and services. Patria offers extremely modular and high performance armoured wheeled vehicles: Patria AMV product family and Patria 6x6, and then also an unrivalled Patria Nemo 120mm mortar system and system level sustainment support, among its other top-notch products and services. Patria AMVXP, Patria 6x6 and Patria Nemo are market leaders in their own segment and set the standards for future warfare capabilities to the highest level.

Website: https://www.patriagroup.com/

RAFAEL Advanced Defense Systems Ltd. is synonymous with Dynamic Defense, Daring Innovation, and Technological Ingenuity. For over 70 years, the Company has pioneered advances in defense, cyber and security solutions for air, land, sea, and space. Our innovations are based on extensive operational experience and understanding of evolving combat requirements. They enable the rapid development of effective solutions for complex battlefield challenges. Always ahead – we ensure an ongoing advantage for our worldwide client base. We are dedicated to continuously enhancing our customer service, as well as expanding our global industrial cooperation program

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Fax: 97233354657
e-mail: intl-mrk@rafael.co.il

Website: https://www.rafael.co.il/

For sovereign security. At RUAG we make a significant contribution to Swiss security. As a future-oriented technology partner, our priorities are innovation (developing new skills, new processes and new business models), the integration of new technologies in existing areas and systems, life-cycle management, and ensuring the availability of military and security systems.

Our extensive product and service portfolio does not just include the provision of trusted information and communication solutions. We also make an important contribution to the availability of fighter jets, helicopters and anti-aircraft defense, as well as wheeled and tracked vehicles.

RUAG is a private-law company under the ownership of the Swiss Confederation. In addition to our main contracting authority, the Swiss Armed Forces, our other customers are mainly national and international armed forces, government agencies and civil security authorities.

Website: https://www.ruag.ch/en

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2 STAR PARTNERS

ARTEC GmbH was founded in 1999. It is a Joint Venture of Krauss-Maffei Wegmann, Rheinmetall MAN Military Vehicles and Rheinmetall Military Vehicles Nederland. ARTEC is responsible for the BOXER development programme for Germany, The Netherlands and Lithuania, acting as the prime contractor. ARTEC is further in charge of the co-ordination of series production and is the focal point organisation for any BOXER export cases.

Main tasks: Programme Management, System Engineering,Configuration Management, Contract Administration.

Website: http://artec-boxer.com/

At BAE Systems, we provide some of the world's most advanced, technology-led defence, aerospace and security solutions. We employ a skilled workforce of 82,500 people in over 40 countries. Working with customers and local partners, our products and services deliver military capability, protect people and national security, and keep critical information and infrastructure secure. BAE Systems Hägglunds focuses on the design, manufacturing, integration and support of a wide range of military vehicles. BAE Systems Land UK provides munitions, armoured vehicle services and bridging equipment. Both companies provide these services to armed forces around the world. For further information, visit www.baesystems.com

Website: www.baesystems.com

As a leading global supplier of drivetrain, mobility, braking, aftermarket and electric powertrain solutions for commercial vehicle and industrial markets, Cummins-Meritor® provides innovative products that offer superior performance, efficiency and reliability. The company serves commercial truck, trailer, off-highway, defense, specialty and aftermarket customers around the world proven leadership in designing, engineering and manufacturing high-performance drivetrain solutions that provide the mobility and safety for tactical-wheeled vehicles across the globe. Since 1909, Cummins-Meritor® has designed, engineered and manufactured leading drivetrain systems across North America, Europe, Asia and South America. Today, our performance-engineered products provide durable, leading-edge solutions for defense applications. Cummins-Meritor's engineering teams carefully study end user requirements to ensure that the customer always comes first in our engineering processes. Our ongoing initiative to reinvent our global Defense portfolio around the requirements and demands of our customers confirms our unwavering commitment.

Website: https://www.meritor.com/

Elbit Systems UK Ltd is a Defence, Technology and Aerospace company with three wholly owned subsidiaries and two joint ventures in the UK. Across 16 sites around the UK we employ over 600 people engaged in a range of high tech and specialist manufacturing activities, with a similar number of jobs sustained directly in our UK supply chain. We work on a range of different technologies for both military and civilian applications.

Website: https://www.elbitsystems-uk.com/

Since 1960, FFG has been a reliable partner for Armed Forces armoured vehicles upgrade, maintenance, overhaul and production. Today FFG is an internationally successful high-tech company that sets new innovative standards in the military market, with satisfied customers from over 40 countries. In addition FFG Drive Technology offers military vehicle servicing, overhaul and base management.

At IAV 2016, FFG presents its latest development the PMMC G5. This highly innovative tracked vehicle represents a new standard platform with outstanding protection capabilities that can rapidly be fitted with various standardised interior kits to meet different mission requirements and to minimize life-cycle costs.

Website: http://www.ffg-flensburg.de/en/home/

The Forward Repair System NATO (FRSN) is a deployable workshop and versatile multitool, that enables military mechanics to solve almost anything, anywhere and in any conditions. The FRSN is built on a reinforced NATO STANAG flatrack and with the on-board crane, powerful generator, air compressor, welder, cutting and full range of diagnostic and hand tools, the FRSN crew will be equipped to support a wide spectrum of operations – from installation of weapons and sensitive equipment in base locations to urgent field repairs of damaged vehicles to get them back into the battle quickly. The FRSN is transported and carried by a tactical truck and can be operational on the ground within 5 minutes of arrival. The FRSN is provided by Glaucus ApS and more information is available on www.frsn.dk and www.glaucus.dk.

Website: https://frsn.dk/

With core capabilities focused on integrated vehicles, power and propulsion and autonomy and connectivity, GM Defense leverages the advanced commercial technologies of its parent company, General Motors (GM) to deliver a more electric, autonomous and connected future for global defense, security and government customers. From internal combustion engines and diesel powertrains to cutting-edge technologies like battery-electric vehicles and hydrogen fuel cells, GM's advanced commercial technologies are at the heart of GM Defense's model for delivering power and propulsion solutions to friendly foreign militaries and government customers.

GM Defense leverages GM's commercial propulsion portfolio combined with GM's committed investments of $35 billion in electric vehicle and autonomous vehicle technologies to deliver modern capabilities that meet unique customer requirements. Drawing on GM's world-class manufacturing, robust engineering and global supply chain, GM Defense delivers highly customized solutions at nearly any level of production while providing its customers access to maintenance and support on a global scale.

With a strong commitment to support the global defense community, GM Defense announced GM Defense International in the summer of 2021 to extend the business' reach into global markets. GM Defense International will focus on helping global defense and government customers transition to a more electric future while supporting unique requirements enabling them to operate in dynamic and evolving environments. For more information, please visit www.gmdefensellc.com.

Website: www.gmdefensellc.com

Horstman, a Company of the RENK group is an agile and growing business comprising businesses units in the UK, US and Canada. Providing world leading design and manufacturing capabilities, our customers benefit from our time-tested pedigree in innovation, product development manufacture and defence project management in heavy armoured and tracked vehicle suspension systems.

Horstman led the world in the 1920's with development of the independent suspension bogie that bears its name, and the company's influence features on tanks and wheeled vehicles to this day.

With over a hundred highly skilled employees in the UK, US and Canada, we are a high value added, innovative engineering business with a global footprint in both customer base and supply chain. We provide a quality, technically excellent offering to solve customers' problems, throughout the product life cycle.

The defence heavy armour business has arduous development and testing cycles to ensure that the serving soldier has the best combination of armour, firepower and mobility that they deserve. Horstman provides this balance to our customers – having built our talent base over decades from a combination of industry experts, service veterans and continuous investment in apprenticeships, graduates and training.

Website: https://horstmangroup.com/

"INKAS® Armored Vehicle Manufacturing is a leading Canadian-based and ISO-Certified company specializing in the design, production and deployment of a wide range of security and defence solutions to its global clientele. The company's mission-proven armored SUVs, APCs and MRAPs are in active duty by various military, law enforcement and institutional clients on a global scale. INKAS® also offers a suite of tactical intelligence, electronic countermeasures, and cyber intelligence solutions to global governments to better prepare them for the threats of tomorrow.

Since 2000, INKAS® has accumulated the necessary knowhow as well as a footprint to supply the world's leading agencies with products and services that accurately meet their project timelines and complex requirements."

Website: https://inkas.ca/

KONGSBERG is a leading global technology corporation delivering mission-critical solutions with extreme performance for customers that operate under extremely challenging conditions. The group has fulfilled demanding customers' needs and adapted to changing market conditions throughout its proud 200-year-old history. Please visit https://www.kongsberg.com/what-we-do/ and follow Kongsberg and Kongsberg Defence & Aerospace on LinkedIn.

Website: https://www.kongsberg.com/what-we-do/

Markforged (NYSE: MKFG) is reimagining how humans build everything by leading a technology-driven transformation of manufacturing with solutions for enterprises and societies throughout the world. The Markforged Digital Forge brings the power and speed of agile software development to industrial manufacturing, combining hardware, software, and materials to solve supply chain problems right at the point-of-need. Engineers, designers, and manufacturing professionals all over the world rely on Markforged metal and composite printers for tooling, fixtures, functional prototyping, and high-value end-use production. Markforged is headquartered in Watertown, Mass., where it designs its products with over 350 employees worldwide. To learn more, visit www.markforged.com.

Website: https://markforged.com/

Moog is a global designer, manufacturer, and integrator of precision motion control and stabilisation products and systems for the defence industry. We offer high-performance products and systems across air, land, and sea platforms. Military forces around the globe recognise us for turreted weapon systems, counter-unmanned aerial systems (c-UAS), fast ammunition handling, precise missile steering, weapon stores management systems (SMS), vehicle conversions and upgrades, near silent actuation for submarines and unmanned undersea vehicles (UUVs), and defense sustainment services.

Our latest innovation, the RIwP (Reconfigurable Integrated-weapons Platform), is a remote weapons platform offering multiple weapon options to guarantee tailored overmatch in every combat situation. Engineered with many advanced features, RIwP includes high-performance target acquisition technology and unmatched pointing/stabilsation accuracy ensuring military forces see first, engage first, and achieve mission success.

Website: https://www.moog.com/markets/defense.html

Nexter, the leading French land defense company and European major player in the ammunition sector is part of the KNDS Group. Nexter gathers French and European defense technological and industrial base around major programs to allow the armies to meet the challenges of the future. In France, Nexter is fully committed to meeting the objectives of the SCORPION program, through the upgrade of the Leclerc tank and the development of the GRIFFON and JAGUAR vehicles within the temporary business venture between Nexter, Thales and Arquus, as well as the SERVAL. The group's range of products also includes TITUS® and VBCI armored vehicles, CAESAR® and 105LG1 artillery systems, smart ammunition (BONUS), robots, equipment, customer support and services.

Website: https://www.nexter-group.fr/en

Founded in 1976, Nurol Makina has been involved in the defense sector since 1992, and is currently engaged in the production of 4x4 tactical wheeled armored vehicles at its modern facilities in Ankara/Turkey. Nurol Makina has a high production capacity, based on state-of-the-art technological infrastructure that includes 5-axis laser cutters used for the processing of steel armor, 7-axis robotic welding machines, hydraulic eccentric presses, and heat treatment and painting units.

Nurol Makina has always distinguished itself from other companies through its unique designs in the land platforms segment, and has a test area that enables it to carry out performance tests such as; trench crossing and obstacle climbing, side and steep slope climbing, crossing rough terrain and deep fording. Nurol Makina produces Ejder YALÇIN 4x4, NMS 4x4, Ilgaz 4x4, Ejder TOMA 4x4 and Ejder Kunter 4x4 mainly for the Turkish Armed Forces and the Turkish National Police, as well as for organizations abroad.

Nurol Makina is aware of the fact that its strength lies in its huge family of employees, and its ability to blend their innovative efforts in the defense sector while adhering to its corporate values and more than 40 years of engineering experience. Nurol Makina continues to secure its position as a sectoral leader in Turkey, combining design and technology, and adhering to the principles of national development, social benefit and environmental protection.

Website: https://www.nurolmakina.com.tr/en

Rheinmetall BAE Systems Land (RBSL) is a UK-based defence engineering company specialising in the design, manufacture and support of military vehicles used by the British Army and international customers.

RBSL has designed and developed many of the British Army's armoured vehicle fleets through its heritage companies. Now as a joint venture business between Rheinmetall and BAE Systems, RBSL continues to provide in-service support to these vehicles as well as deliver some of the UK MOD's latest land programmes.

RBSL recently received an £800m contract to upgrade 148 British Army Challenger 2 Main Battle Tanks. The upgraded vehicle, to be called Challenger 3, will be a network-enabled, digital Main Battle Tank with state-of-the-art lethality, upgraded survivability, plus world-class surveillance and target acquisition capabilities.

RBSL is also one of two manufacturers delivering over 500 Boxer vehicles to the British Army. Through its £860m contract, RBSL will manufacture approximately half of the new fleet, undertaking the fabrication of the vehicle structures together with the assembly, integration and test of the complete vehicles.

RBSL currently employs a highly-skilled workforce of more than 530 people, including over 260 engineers, located at its headquarters in Telford as well as at sites near Newcastle, Bristol and in Dorset. RBSL also employs a team 40 apprentices, with plans to expand its early careers community over the coming years.

From engineering to project management, business support and manufacturing, RBSL offers a diverse set of capabilities allowing us to support our global customers, enhance national security, and contribute to UK prosperity.

Website: https://rbsl.com/

The benchmark for active and passive deception since 1957.

Our multispectral systems provide optimised performance in all parts of the electromagnetic spectrum where there are a fielded sensor as; ultraviolet, visual, near infrared, Short Wave infrared, thermal infrared and broad band radar.

In-house R&D and production resources, using cutting edge scientific instruments and bespoke production machinery, guarantee the fielded capability.

Barracuda capabilities provides the prerequisites to win Our solutions include enhanced logistics, sustainability and a quick return of investment.

Meeting demanding specifications for tough environments is our everyday mission and we are ready to take on any of your challenges.

Website: https://www.saab.com/

At ST Engineering, we apply our technology and innovation to solve real-world problems and improve lives. Our dedication to excellence and our strong track record have earned us a distinctive reputation for quality and trust as a global technology, defence and engineering group. Our diverse portfolio of businesses spans the aerospace, smart city, defence and public security segments.

We help nations protect their citizens by meeting their air, land and sea defence needs and equipping their fighting forces to perform on the battlefield. Our cybersecurity and critical systems help our customers enforce public and homeland security in an increasingly digital world. And our satellite communications equipment contributes to much of the world's network connectivity.

Website: https://www.stengg.com/

Texelis is a leader in the design and manufacture of axles, drivelines and total mobility solutions for 4 × 4, 6 × 6 and 8 × 8 military vehicles. Expertise gained over many decades working with vehicle manufacturers and military forces across the globe.

In 2018, the DGA has entrusted the development and implementation contract for Light VBMR to Nexter and Texelis. The Light VBMR fulfils the light vehicle component of France's "SCORPION" programme.

Texelis is responsible for delivering the full vehicle driveline for integration with the systems produced by Nexter for Serval. This solution has been designed to maximise mobility for the extremely demanding and restrictive environment in which the French Army's vehicle fleet operates in today's battlefield, delivering advanced protection, and enhanced strategic and tactical mobility.

Texelis supports both manufacturers and operators throughout the product lifecycle, from initial design through renewal. Permanent attention is paid to the technical, robustness and adaptability to always meet the end-users needs and requirements.

By expanding its offer developing chassis and mobility kits for monohull vehicles Texelis is proving all its know-how and technology and is positioning itself as the mobility partner of armored vehicles of today and tomorrow.

Website: https://www.texelis.com

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1 STAR PARTNERS

Founded in 2001, Bohemia Interactive Simulations (BISim) is a global software company at the forefront of simulation and training solutions for defense and civilian organizations. Our in-house engineers use the latest game based technology to develop high-fidelity, cost-effective training and simulation software products and components for defense applications.

Globally, 500,000+ military personnel are trained every year using our high fidelity VBS software products. More than 60 NATO and NATO-friendly countries, and over 250 integrators/prime contractors use VBS technology; many making significant funding commitments to extend VBS product capabilities. Our customers include the U.S. Army, U.S. Marine Corps, Australian Defense Force, Swedish Armed Forces, French MoD, UK MoD and major integrators. Our flagship VBS products have become one of the most widely used COTS product ranges in the military-simulation sector, supporting hundreds of military use cases and greater military exploitation.

Website: https://www.bisimulations.com/

The defence and military industries include some of the most demanding applications for precision bearings with manufacturers seeking the latest technology to rotate critical military equipment with ever-increasing speed, accuracy and durability. The IAV conference provides precision bearings and tooling equipment specialists CARTER MANUFACTURING with the ideal event to demonstrate its industry leading bearings specifically designed for the loadings, temperatures and speeds in the most challenging military applications.

Our range includes; thin section bearings, gimbal bearings, light weight slewing rings, super precision bearings, miniature bearings, high and low temperature bearings, spherical plain bearings and aerospace bearing tools. Key benefits of our bearings include; outstanding precision, torque performance and stiffness, combined with durability and ultra-light weight. Accreditations include ISO9001 which incorporate the requirements of AS9120 with flow down from AS9100.

Carter Silverthin thin section bearings for gimbal mounts are specially designed for communications and tracking systems, delivering the key benefits of extreme accuracy, optimum load carrying, extreme smoothness and high rotational speed. They are also ideal for satellite, radar and microwave applications coping with radial, axial and overturning moment loads simultaneously whilst delivering stiffness with low rotational torque. For applications requiring light weight, corrosion resistant, slewing bearings, Carter offer the UNASIS Slewing bearing range which are used successfully for Turrets, Radar and sonar systems. Defence and military industries demand systems which must deliver outstanding performance, even in the most extreme and hostile environments. Rest assured that Carter Bearings can be your specialist partner because we have developed a proven range of bearings which will meet and exceed your expectations.

Website: www.carterbearings.co.uk

CES is a global leader in the design, development and manufacturing of advanced composite parts and assemblies for the defence, aerospace, transport, and energy sectors. With expertise in composite component design, development, and production, CES has also invested in R&D activities to expand its product portfolio to cover ballistic product manufacturing. Through its facilities in the United Kingdom, Turkey, and Singapore, CES has the infrastructure, capability and capacity to supply advanced composite materials, ballistic protective armour and engineering services to local and international customers.

Website: https://www.ces.com.tr/

CTA International (CTAI) is a 50/50 Joint Venture between BAE Systems and Nexter Systems.

CTAI manufactures the revolutionary 40 mm Cased Telescoped Armament System (40 CTAS); the world's most powerful and compact medium calibre weapon. Over 600 weapons and 100,000 rounds of ammunition have been produced to-date, with deliveries in progress for three NATO users.

The 40 CTAS features an intelligent ammunition handling system, which automatically retrieves and loads selected munition natures to deliver maximum versatility and protection against a range of threats. Competitive through life costs are assured by the availability of low-cost training munitions, a minimal maintenance/servicing burden and the need to fire significantly less ammunition than a conventional medium calibre weapon for the same effect on target.

CTAI continues to expand its portfolio and is currently developing anti-air and naval weapon variants.

Website: https://www.cta-international.com/

Cook Defence Systems is the world's leading independent designer and manufacturer of tracks for armoured vehicles, and can trace its history as a track manufacturer back to 1940.

Cook tracks are in service on all the fighting vehicles of the British Army and with many other armed forces around the world.

Cook Defence Systems can design a lightweight, high durability track system to fit any fighting vehicle. Cook tracks have been selected by many major prime contractors for the most modern platforms currently under construction.

Cook Defence Systems is also a trusted manufacturer of armoured steel castings to British, international and proprietary specifications.

Website: https://www.william-cook.co.uk

David Brown Santasalo is a leading provider of mechanical power transmission solutions for defence applications.

With almost three centuries of combined gear engineering expertise, we deliver new defence gear units as well as a full range of gearbox support services. With more than 1,000 employees, seven major manufacturing plants and 24 service centres across six continents, we are ideally equipped to serve a growing customer base in land and marine defence markets.

From submarines to main battle tanks, we provide customers globally with reliable gearboxes that have been proven time and time again.

A Strong Partnership with the Defence Industry
David Brown Santasalo has been an integral part of the defence industry for more than 100 years. Always at the forefront of new technologies, we have supplied more than 10,000 gear systems to a range of land and marine applications globally.

Through our highly responsive and capable local teams, we support customers worldwide. Our gear systems and service solutions underpin assurance critical applications in industries where failure is not an option.

Land Defence
David Brown Santasalo is internationally recognised as a supplier of dependable and innovative power transmission systems for land defence applications. With an extensive installed base and a track record of reliability, product upgrade and life extension, David Brown Santasalo delivers advanced gear system design for the most demanding military applications.

Our range of land defence products include:
Tracked Vehicle Cross Drive Transmissions
Tracked Vehicle Final Drives
Power Take Offs for Hydraulic Pumps, Electrical Generators and other Ancillary Drives
Wheeled Vehicle Bevel Boxes
Wheeled Vehicle Drop Boxes
Sandwich Transmissions for Vehicle Water Drive Applications

To find out more please visit www.dbsantasalo.com or contact us on +44 (0) 1484 465500.

DST Defence Service Tracks GmbH is a world leader in the development and manufacture of track systems and running gear components for tanks and armored vehicles. Currently, over 100 different track solutions are in use in more than 50 armed forces worldwide. All tracked vehicles in service with the German Army run on DST tracks.

A track system is only as strong as its weakest link. As the only track manufacturer worldwide that develops and produces all key rubber and steel track components in-house, DST delivers products capable of fulfilling the demands of every fleet in any terrain with unrivalled durability, easy maintenance and long-term cost efficiency. It is only through the perfect interplay of track links, road wheels, support rollers, idler wheels, damper rings and sprockets from one supplier that longevity and reliability can be guaranteed even in the most demanding environment.

DST's highly qualified employees develop and produce tracks and other components for military and civil applications with the speed, efficiency and uncompromising commitment to quality that sets DST apart from the

competition. Furthermore, by working in close coordination with clients and users, DST is able to develop customized solutions for any tracked vehicle and bring them into service in the shortest possible timescale.

Whether for the 3 ton light Weapons Carrier Wiesel with 64 kW or the 70 ton heavy Main Battle Tank LEOPARD 2 with more than 1100 kW, DST Steel System and Lightweight Tracks as well as Segmented Rubber Band Tracks enable the optimum transfer of engine performance to the ground for unrivalled efficiency and mobility.

DST – The Base for your Fleet.

Website: http://www.defence-st.com/

Environics

Environics is a Finnish company with over 35 years of experience from improving CBRN safety around the world with its in-house technologies and system solutions.

We provide chassis independent chemical, biological and radiation (CBRN) detection & monitoring system for armoured vehicles. Our new X-System scales effectively from single point detection to more comprehensive systems, covering monitoring of internal and external CBRN threats encountered in vehicle environment.

Environics´ robust design of armoured CBRN systems is built upon the proven expertise in the field, summing up high usability, feasibility, cost-effectiveness and maintainability demands set by vehicle manufacturer, integrators and operators. The core of the systems is formed by the ChemProX-DS, providing CWA/TIC detection, status information and integration interface for additional CBRN sensors and data communication to 3rd party systems like a BMS.

Website: https://environics.fi/

EuroTrophy

EuroTrophy GmbH is the European hub for the marketing, sale and production of the Trophy® Active Protection System (APS). Based in Germany, the company provides high-end, state-of-the-art Active Protection Systems that substantially enhances the protection level of armored vehicles, thus safeguarding their crews. The company also provides vehicle integration support services and related through-life support of the APS. These services significantly improve the security of supply of Trophy® APS to its existing European user nations, and its potential future customers. The company focuses on the needs of the European defense community.

Website: https://euro-trophy.de/

FT TECHNOLOGIES

Compact wind sensor for remote weapons stations

FT Technologies' compact, rugged wind sensors have been delivering reliable data in the harshest of environments for over 20 years. Combat-proven and designed to withstand severe shocks, FT wind sensors function in extreme temperature ranges and are sealed to IPX6K. Tried and tested on remote weapon stations, in CBRN detection, ballistic meteorology, onboard sUAS and at UAV ground control stations to provide consistent, reliable data and increased accuracy for fire control. With thousands of sensors deployed around the world and over 30 external certifications, the quality of FT sensors is second to none.

One of the most popular models for remote weapon stations is the FT722 Pipe Mount. The sensor is only 16cm tall, weighs 350g and reads wind speeds of up to 50m/s.

Website: https://fttechnologies.com/

GAARD TECH

GaardTech fabricates advanced robotic systems for Asymmetric Combat, Deception and Joint Force Training. We are a veteran founded company which focuses on the experience of the end users, and layer the tactical and technical to provide our customers with an asymmetric edge. GaardTech is able to service customers around the world through our global corporate structure including GTAUS, GTUK and GTUSA.

Contact us in your region at:
www.gaardtech.uk
www.gaardtech.com.au
www.gaardtechusa.com

Website: https://www.gaardtech.uk/

InnaLabs

We are a European, high technology company built on decades of proven and practical experience in the field of inertial sensors technology. Our high-performance accelerometers, gyroscopes and systems meet the stringent requirements of customers for precision guidance, stabilisation, navigation and orientation applications. Today, InnaLabs® attracts skilled scientists, industrialists, automation and electronics experts who bring together a wealth of experience and expertise to develop inertial solutions.

Website: https://www.innalabs.com/

INVISIO®

INVISIO develops and sells advanced communication systems that enable professionals in noisy and mission critical environments to communicate, protect their hearing and work effectively. The company combines specialist knowledge in acoustics and hearing with broad engineering know-how in software, materials technology and integration. INVISIO's solutions are marketed under the two brands INVISIO and Racal Acoustics. Sales are via the headquarters in Copenhagen and sales offices in the USA, France, the United Kingdom, Italy and Thailand and via a global network of partners. Learn more on www.invisio.com and www.racalacoustics.com.

Website: https://www.invisio.com/

John Cockerill

John Cockerill Defense specializes in high-power multifunctional weapon systems for light & medium weight armored vehicles. With more than 200 years of experience, it offers complete and innovative solutions: Cockerill® modular gun-turrets (25 to 120mm), technical and tactical training, Agueris® simulators, maintenance and services throughout the life cycle of the Cockerill® weapon systems, and innovative enhancements to develop their capabilities.

Website: www.johncockerill.com/defense

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kappa

Kappa has over 40 years of experience in developing and manufacturing application-specific cameras and vision systems in extremely robust and certifiable designs for harsh environments. The Defense Land business unit focuses on high-performance driver vision enhancers and situational awareness solutions as well as inspection systems for high-caliber gun barrels. Our zero-latency, multispectral vision solutions with day and night vision are based on high-quality LWIR and CMOS sensors. Scalability and adaptability characterize our systems. The focus is always on the maximum performance of the overall system and the customer's roadmap for the future. We achieve safety levels for approvals in regulated markets with standardized design assurance procedures in hardware and software development, e.g., up to SIL 2/ASIL-B/DAL-B, ISO 26262, MIL-STD 810/461/1275, NATO Supplier Code C4792.

Website: https://www.kappa-optronics.com/en/defense-land/

MICHELIN

Michelin, the leading tyre company, is dedicated to sustainably improving the mobility of goods and people by manufacturing and marketing tyres for nearly every type of vehicle. With the X®Force™ range of off-road truck tyres, Michelin provides excellent mobility and robustness for military vehicles in extreme conditions of use. With tyres ranging from 16 to 27 inches designed to meet the FINABEL runflat protocols, safety of military personnel is paramount for Michelin. Headquartered in Clermont-Ferrand, France, Michelin is present in 177 countries, has 124,760 employees and operates 68 tyre production facilities which together produced around 173 million tyres in 2021.

Website: www.michelin.com

Microflown AVISA (www.microflown-avisa.com) provides state of art unique solutions by using the concept of Passive Acoustic Distributed Sensing (PADS), and exploiting a universal sensor platform (CASTLE). Microflown AVISA offers sheer firmware defined capabilities for:

Vehicle (crew) survivability, Collaborative Protection
Counter battery target acquisition

PADS allows to detect, localize, track, categorize and classify all kinds of audible signals:
Firing Events
Direct
Small Arms Fire (SAF)
Board Canons
RPGs and ATGMs (Under Development)
Indirect
Rockets, Mortars And Artillery (RAM) •
Movement of Platforms (under development)
Heavy Ground Vehicles
Airborne Platforms

Microflown AVISA solutions are scalable for growth of capability, either by multitasking with the same hardware, and/or by adding new firmware capabilities over time.

CASTLE, a hardwired subarray of four Acoustic Multi Mission Sensors (AMMSs), has favorable SWaP features and works in all weather conditions "while on the move" or "while firing". The networked based capabilities gracefully vary with the number of CASTLE's in the network and the available bandwidth. A single, not networked CASTLE, loaded with ACoustic LOcalization Of GUnShots (ACLOGUS) firmware is able to detect incoming direct fire. The ACLOGUS system can: cue a RCWS or a camera and provide dismounted soldiers around an "acoustic umbrella".

The Mobile Sound Ranging Array firmware is based upon a network of CASTLEs and, provides valuable information for:
Target acquisition
Fire Control
Predicting Impact

Ground and vehicle based versions are in use by various NATO Countries. To find out more, please contact avisa@microflown.com

Website: https://www.microflown-avisa.com/

In a strong position due to more than 60 years' experience, NBC-Sys, a Nexter Group brand, based in Saint-Chamond, is able to meet the most complex expectation of armed forces regarding CBRN threats.

NBC-Sys, therefore masters many technologies for protection against CBRN threats and is an expert in the fields of individual protection, detection and decontamination allowing it to implement a wide range of activities ranging from design to production and maintenance in operational conditions.

Website: https://www.nexter-group.fr/en/filiales/nbc-sys.html

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NVTS Night Vision Technology Solutions is a U.S. manufacturer of thermal driver vision cameras (DVE) including the AN/VAS 5B and Remote Weapon System optics. We support current and legacy armored vehicles, ranging from the advanced JLTV to the M-88. NVTS can kit DVEs to fit most European and U.S. armored vehicles. NVTS is a Service-Disabled Veteran Owned Small Business.

Contact: joe@nvtsglobal.com

Website: nvtsglobal.com/

Pearson Engineering is a world-leading provider of Counter-Mine, Counter-IED, Combat Earth Moving, Route Proving and Assault Bridging Equipment for Armoured Vehicles. Our products include Mine Ploughs, Combat Dozer Blades, Earth Anchor Blades, Excavator Arms, Bridge Launch Mechanisms, Mine Rollers, Surface Clearance Devices, Obstacle Marker Systems, IED Route Clearance Equipment and Vehicle Remote Control Systems.

Our products are supplied as vehicle attachments and may be fitted ether directly or via a common interface system. Their quick and easy attach and release ensures the right equipment is available for the job when it is needed.

Recent acquisition of the Armstrong Works, Newcastle upon Tyne, has added additional manufacturing space to Pearson Engineering's facilities and includes the capability to cut, profile, fabricate, weld and machine armoured steel and aluminium and to test and demonstrate armoured vehicles. Our services include the supply of complex manufacturing, repair and support services for defence assets such as armoured hulls, turrets, armour packs and military bridges.

Website: http://www.pearson-eng.com/

Roketsan Ballistic Protection Center (RS-BPC) is the Turkish center of excellence for the design, manufacture and support of survivability solutions for the Turkish Army and international customers. RS-BPC is the supplier of the armor system of Altay Main Battle Tank. Recent projects include modernization of Turkish Leopard 2A4 Main Battle Tanks. 60 Leopard 2A4T1 Armor System has been integrated to the tanks and 160 tanks will be modernized by the end of the ongoing programme. In addition to tank modernization programmes, 180 RPG Protection Kits have been integrated to KİRPİ MRAP's and various types of armored vehicles which include 6x6/8x8 APC. Furthermore, solutions for air platform and force protection are already battle proven and ready for our customers. RS-BPC's extensive infrastructure includes open proving ground and ballistic laboratory for testing of all kinds of modern ballistic threats (ATGMs, APFSDS, mines, RPGs and IEDs), material dynamic characterization equipment and simulation hardware.

The core competencies of RS-BPC are summarized as:
Design and development of add-on/built-in armor systems for all land platforms
Serial armor production
Ballistic threat library
Vulnerability and survivability analysis of platforms
Development of armor ceramics and energetic materials for reactive armor applications
An extensive database of 10000+ ballistic tests

Website: https://www.roketsan.com.tr/en/solutions/ballistic-protection-systems

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Rheinmetall is an integrated technology group with about 25,000 employees worldwide, the listed Rheinmetall AG stands for a strong, international company that operates in various markets with an innovative range of products and services. Tactical vehicles on both wheels and tracks. Lynx KF41 is highly mobile, well protected and modular medium tracked vehicle. Tactical wheeled vehicles include the Fuchs armoured transport vehicle or the Boxer 8x8 armoured vehicle produced in cooperation with KMW.
Modern armed forces depend on efficient logistics vehicles in the most remote operational areas. The HX vehicle family from Rheinmetall MAN Military Vehicles (RMMV) is uncompromisingly designed for military use under the toughest deployment conditions - Over 14,000 HX are currently in use worldwide.
Weapon and Ammunitions portfolio includes solutions for threat-appropriate, effective and accurate firepower as well as comprehensive protection. Rheinmetall has a unique overall protection portfolio, comprising products and services for light, medium and heavy-duty protection. Electronic Solutions covers the entire chain of effects in the system network: from sensors and the networking of platforms and soldiers to connection of effectors. Comprehensive training and simulation solutions. The division has key technologies in Air Defence & Radar Systems, Integrated Electronic Systems and Technical Publications. Rheinmetall has each of the divisions represented across the UK, creating several hundred jobs in Bristol, Telford, Isle of White and Washington. We provide key technology to the UK customer including the cutting edge trailblazer camera system. 18,000 vehicles in service with the British Army and coming soon is the best in class Armoured Fighting Vehicle in Boxer and Main Battle Tank in Challenger 3. We are a key supplier in the weapons and ammunition sphere who contributes to the British Army's resilience and deterrence.

Website: https://rbsl.com/

Saft specializes in advanced technology battery solutions for industry, from the design and development to the production, customization and service provision. For 100 years, Saft's longer-lasting batteries and systems have provided critical safety applications, back-up power and propulsion for our customers. Our innovative, safe and reliable technology delivers high performance on land, at sea, in the air and in space. Saft is powering industry and smarter cities, while providing critical back-up functionality in remote and harsh environments from the Arctic Circle to the Sahara Desert. Saft is a wholly-owned subsidiary of Total, a leading international oil and gas company and a major player in low-carbon energies.

We energize the world. www.saftbatteries.com

Website: http://www.saftbatteries.com

For the past 35 years, ScioTeq has been providing the Defense & Security market with reliable and high-performance visualization solutions that produce real-time high-resolution images, even in the harshest environments.

Our offering includes rugged displays, deployable workstations and video distribution. These are used for a range of applications, including naval (surface and subsurface), ground army (both wheeled and tracked vehicles, as well as mobile command posts), shelter (surface-to-air missile defense and UAV ground control stations), and airborne applications.

ScioTeq's software and hardware gives decision-makers the real-time information they need to make split-second decisions in critical situations.

Website: https://www.scioteq.com/en

Soucy International a private corporation established for 50 years has developed within his Defense Division its own manufacturing equipment and facilities to meet the specific requirements of each application – from Articulated Tracked Vehicles (ATV) to military vehicles up to 45 mT, offering the following advantages and benefits:

Increased durability
Reduced vibration (up to 70%) & noise (up to 13dB)
Reduced thermal signature
Reduced vehicle weight (up to 50%)
Reduced fuel consumption (up to 30-35%).
Reduced vehicle crew fatigue
Significant reduction in life cycle costs and virtually maintenance free.

Website: https://www.soucy-defense.com/

SKYDEX is a global leader in advanced impact mitigation and cushioning solutions and is dedicated to Protecting Things That Matter®. With superior precision, durability and tunability, our proprietary technology is engineered to excel in the harshest and most demanding conditions.

SKYDEX is excited to introduce our expanded product line of blast mitigating vehicle decking. SKYDEX Convoy Deck absorbs energy forces transmitted to occupants through the vehicle floor during a blast event, reducing the probability of injury. Our solutions have been field tested in over 20,000 vehicles and have been the go-to solution for threat mitigation from underbody mine blasts.

Ultra specialises in providing application-engineered bespoke solutions. We focus on our customers' mission critical and intelligent systems in the defence, security, critical detection & control markets. Our capabilities and technologies can be found on many of the world's long-term military programmes. We employ over 4,500 employees across the globe and are listed on the London Stock Exchange.

Ultra Precision Control Systems (Ultra PCS) is a Business Unit within Ultra Group.

Located in Cheltenham, Ultra PCS is the centre of excellence for Land Systems within Ultra and provides electronics and software solutions for military vehicles, soldier systems and forward operating bases.

Website: https://www.ultra-pcs.com/

VRAI works with OEMs & front line commands in Defence and Security, supporting them to transform how they deliver simulation training, in order to better prepare their troops to face an increasingly complex operational environment.

VRAI's critical insight is that Virtual Reality (VR), as well as being a great way of presenting data to a user, is also an incredibly powerful data capture and storage medium.

In an increasingly complex operational environment, often characterised by forces operating advanced technological platforms but with reduced headcount and increased personnel turnover, many western militaries face the need to transform how they train and prepare their forces.

The award winning ReACT armour crew sim increases training & repetition opportunities for armour crews, using immersive VR environments to replace the need for real world platforms, using cutting edge data exploitation capability to provide insights, while decreasing the carbon footprint of training.

The ReACT armour crew sim allows troops to train when and where they need to, instead of being reliant on real world training exercises to get access to realistic training.

The ReACT armour crew sim is built from the ground up, we know it solves a problem because we worked with front line military end users to inform how it was designed.

Website: https://vraisimulation.com/

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LIVE CALENDAR OF EVENTS 2023

JANUARY

23-26 January
International Armoured Vehicles
Twickenham Stadium, London

FEBRUARY

21-23 February
International Military Helicopter
Hilton Wembley, London, United Kingdom

21-23 February
Additive Manufacturing for Aerospace & Space
London, United Kingdom

MARCH

15-16 March
Deployed Medical & Healthcare Delivery
Copthorne Tara, London, United Kingdom

28-30 March
Military Flight Training
London, United Kingdom

APRIL

18-20 April
C2ISR Global
Hilton Syon Park, London, United Kingdom

MAY

17-18 May
Space Operations Summit
Copthorne Tara, London, United Kingdom

23-25 May
Future Artillery
Munich, Germany

JUNE

27-29 June
Full Spectrum Air Defence
London, United Kingdom

JULY

25-27 July
Surface Warships & OPV International
London, United Kingdom

SEPTEMBER

26-28 September
Disruptive Technology for Defence Transformation
London, United Kingdom

27-28 September
Armoured Vehicles Eastern Europe
Venue, TBC

NOVEMBER

07-09 November
International Fighter
Madrid, Spain

08-10 November
CABSEC/Warships & OPV Latin America
Cartagena, Colombia

DECEMBER

05-07 December
International Dismounted Soldier
London, United Kingdom

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