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The Defence Suppliers Directory Magazine

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ExCeL, London www.DSEI.co.uk

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10-13 September 2019

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REGISTER TODAY FOR THE WORLD LEADING DEFENCE & SECURITY EVENT

Defence & Security Equipment International is the world leading event that connects governments, national armed forces, industry thought leaders and the global defence & security supply chain on an unrivalled scale. With a range of valuable opportunities for networking, a platform for business, access to relevant content & live-action demonstrations, the DSEI community can innovate, share knowledge, discover & experience the latest capabilities across the Aerospace, Land, Naval, Security & Joint domains.



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Welcome to this
special **DSEI 2019**
edition of the
**Military Systems &
Technology Magazine.**

As an established web portal for the International Defence & Aerospace Industry, we strive to provide a comprehensive and detailed listing of Military Equipment Suppliers, Products and Services. This newsletter is designed to keep you up-to-date with latest news and events within the Defence Industry's Governing Bodies, Organisations and Companies.

The Defence Industry Web Portal

For more information, technical guidance or the latest subscription packages available for Military Systems, Naval Systems and Security Systems, please contact us where one of our team will be more than happy to advise you.

T +44 (0) 1398 351606

E sales@militarysystems-tech.com

W www.militarysystems-tech.com

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CELEBRATING 20 YEARS

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10–13 September 2019

The World Leading
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DSEI exhibition celebrates its 20th year!

The upcoming edition of Defence and Security Equipment International (DSEI) will mark 20 years since the event was first established as 'the British Army and Navy exhibition'



Returning to **ExCeL London 10-13 September 2019**, DSEI now encompasses the entire defence and security audience, including Air, Land, Naval, Security and Joint, and has grown – both in size and content – to reflect the complex nature of modern warfare and security operations.

Twenty years in defence is a long time – and the industry has evolved considerably – unrecognisably in many respects – since 1999. Priorities changed significantly, and rapidly, after 11 September 2001 – which many of us learned of while in the exhibition halls of DSEI.

The intensifying threat from the “digital battlefield”, wide-ranging cuts to defence spending and expansion of technological know-how during this time have shaped and reshaped the way industry does business.

DSEI 2019 will overwhelmingly focus on Emerging Technologies, Cross-Sector Exploitation and International Collaboration. Visitors can also expect significant focus on Artificial Intelligence; Autonomous Systems; Robotics; and Big Data, from the industry’s leading lights. These themes will run throughout the exhibition and conference programme.

Held biennially, DSEI connects governments, national armed forces, industry thought leaders and the global defence and security supply chain on an unrivalled scale. The event is curated to consistently support both the prime contractors as well as small and medium-sized enterprises while, crucially, giving the UK exports a significant boost. On a rolling 10 year basis, the UK remains the second largest global defence exporter. In 2017, it won defence and security orders worth £9 billion and £4.8 billion respectively, up on the previous year (£5.9 billion and £4.3 billion).

DSEI will also promote the global supply chain via dedicated new feature areas on the exhibition floor. These specialised “hubs” will showcase cross-sector suppliers within the Manufacturing, Innovation, Communications, Cyber, Space and Maintenance, Repair, Overhaul & Upgrade domains.

Exhibiting companies featuring for another year include Eclipse Defense Technologies, who have developed a projectile launching device which operates on compressed air and automatically adjusts muzzle velocity to maintain less-lethal impact forces regardless of target range, and Hesco Group – a leading perimeter protection specialist looking to expand on ongoing success in the private and public spheres.

Many products, now globally renowned, were first introduced to the market at DSEI. Remember the LifeSaver water bottle which debuted its pioneering water-purifying drinking vessel to the world at DSEI in 2007? The product was named DSEI’s “Best Technological Development” and the entire stock sold out within four hours of the presentation. Having first caught the attention of the British Army, the Lifesaver water bottle is now used globally by militaries, humanitarian teams and outdoor enthusiasts.

DSEI 2019 will also see the debut of both Latvia and Lithuania, who will for the first-time host national pavilions providing a hub of their countries’ defence and security ingenuity. Among the 30 country pavilions confirmed to date, nations such as the Czech Republic, Holland, Denmark, Slovakia, and Australia have significantly larger areas, reflecting the rise in exportable expertise from these regions, and a desire to develop international partnerships.

DSEI 2019 ZONES

DSEI IS THE ONLY DEFENCE & SECURITY EVENT
TO OFFER FIVE SECTOR FOCUSED ZONES:
AEROSPACE, LAND, NAVAL, SECURITY AND JOINT.



The Aerospace Zone has a capability area that services the entire aerospace supply chain. The Zone will focus on MRO&U, UAV, weapon systems, upgrade components, fifth generation airframes and third & fourth generation upgrades. New for 2019 will be a pioneering Space Hub.



DSEI's Land Zone is the largest and fastest growing zone featuring the latest in weapons, ammunitions and equipment. Supported by the British Army, the Land Zone is a key platform to see first-hand the latest developments and innovations from international exhibitors.



The Naval Zone at DSEI is an interactive showcase of the latest vessels and technology. Whether you're a buyer, a procurement manager, R&D or looking to penetrate the naval market, The Naval Zone is the place to do business.



The Security Zone at DSEI is a showcase of security equipment, technologies, strategies and systems to counter priority threats, such as cyber attacks as well as border, infrastructure, crowd and crisis security.



The Joint Zone features the latest products and innovations servicing the whole defence & security community with three key hubs: The Innovation Hub, The Medical Engagement Hub and The Communications Hub.



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	DSEI, ExCeL London 2001	DSEI, ExCeL London 2017
Exhibitors	660 exhibitors from 21 countries	1,600 exhibitors from 54 countries
Size	20000m ²	Over 37,000m ²
National pavilions	13	42
Visitors	15,000	35,000 from 104 countries
VIP Delegations	59 from 45 countries	2,760 from 90 countries
Press	250 press from 18 countries	521 press from 40 countries

DSEI Strategic Conferences

Exclusive to DSEI delegates, the Strategic Conferences provide a unique opportunity to hear first-hand from and network with senior military, government and industry representatives, who come together to discuss relevant defence and security topics.



DAY ZERO CONFERENCES MONDAY 09 SEPTEMBER

Hosted by the Royal Air Force, British Army and Royal Navy, the DSEI Day Zero Conferences offer a unique opportunity to meet with senior level personnel across the Defence & Security sector, where principal topics such as long-term industrial strategy and future capabilities will be discussed.



AEROSPACE CAPABILITY CONFERENCE

To enable the Royal Air Force to prevail in a contested and degraded environment, it is undergoing an exciting and world-leading transformation programme to modernise and mobilise its Combat Air, ISR and Air Mobility fleets as well as delivering nascent Ballistic Missile Defence, Cyber and Space capabilities. The Aerospace Conference will explore the integrated approach to operations, fused with Cyber and Space, where commanders require assured information at the speed of relevance.

Theme: *Delivering the Next Generation Air Force*

Sub-themes: *Combat Air, Air C2/ISR, Space, A2AD*



LAND CAPABILITY CONFERENCE

Delegates can expect to hear from senior officers from the British Army

and international Armed Forces. Further details will be available soon on the DSEI website.

2017 speakers included:

- Maj Gen Chris Tickell CBE, Director Capability, British Army
- Maj Gen Kathryn Toohey, Head Land Capability, Australian Army
- Brig Rob Sergeant, then Head of Future Force Development, British Army
- Dr Robert Sadowski, Army Chief Roboticist, U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC)
- Dr Rob Buckingham, Director, UK Atomic Energy Authority (UKAEA), RACE

Theme: *Transforming Land Power to Deliver Competitive Advantage*

Sub-themes:

The Future Starts Now - Delivering Decisive Advantage
Centrality of the Land Domain-The British Army Perspective

Operational Advantage - Collaboration with Industry
Secure, Engage Contest and Fight – Collaboration with Allies and Partners



MARITIME CAPABILITY CONFERENCE

The conference is aimed at bringing together some of the brightest minds in the maritime sector, from the heads of some of the world's leading navies, to industry specialists and political leaders, as we look to explore the opportunities and challenges posed by advances in autonomy, computing and AI. The intent is to review how we can maintain our information advantage, but at a pace that is relevant, enabling machine speed warfare. If we are to continue to outpace our adversaries, we must constantly push the boundaries of technology, harness the power of autonomy whilst in parallel look to how we man and train the Royal Navy of the future.

Theme: *Autonomous Operations in a Digital Navy*

DSEI 2019 HUBS

DSEI PROMOTES THE GLOBAL SUPPLY CHAIN THROUGH SIX SPECIALISED HUBS:
COMMUNICATIONS, CYBER, INNOVATION, MANUFACTURING, MEDICAL AND SPACE.



The Communication Hub will showcase the latest technological developments servicing the whole defence & security industry across aerospace, land, naval, security and joint.



The Space Hub is dedicated to the next generation of space and communications technology, showcasing both upstream and downstream capability. Exhibitors include: Airbus D&S, Avanti, MAXAR, Surrey Satellite Technology, Reaction Engines, among others.



The Innovation Hub provides a platform for start-ups and SMEs to demonstrate emerging technologies and products to global militaries and industry. The hub will showcase technologies from other sectors that have the potential to serve the defence & security industry.



DSEI's Cyber Hub will feature a range of exhibitors from the innovative, growing cyber security industry, underpinned by world-leading scientific research and development.



Packed with practical demonstrations, the Medical Hub gives an exclusive insight into the pioneering work from the military medical professionals as well as the latest life-saving equipment available.



NEW for 2019. The Manufacturing Hub has been developed to support the supply chain. Systems Designers, Integrators and Procurement Managers will be able to meet UK manufacturers looking to penetrate the defence and security sector.

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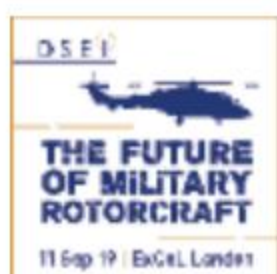


Sub-themes:

Digitisation - How to digitise the Royal Navy and ensure Information advantage is at the heart of the future naval approach

Autonomy - Exploring the opportunities to increase mass, reach and lethality of the Royal Navy

Machine Speed Warfare – Harnessing new, disruptive technologies to gain war-winning advantage
Manpower - Manning and training the future increasingly 'autonomous navy'



TUESDAY 10 SEPTEMBER MEDICAL INNOVATION

Medical Innovation will provide healthcare professionals with an opportunity to share novel ideas and gain a greater understanding of how their engagement with the multidisciplinary construct of resilience is transforming care in a multitude of settings, both in the UK and overseas. The programme will encourage collaboration between military and civilian organisations and will appeal to those with an interest in supporting personnel irrespective of their role along the entire patient care pathway.

Theme: *Enhancing Resilience*

Sub-themes:

Organisational Resilience – Lessons learned
Enhancing Wellbeing – Psychological, Physical and Social

Enhancing Preparedness – Occupational, Clinical guidelines and Training

Enhancing the Workforce Structure – Preparing women for arduous roles

WEDNESDAY 11TH SEPTEMBER



FUTURE OF MILITARY ROTORCRAFT

Participants will include international senior officers and government representatives who are responsible for national military helicopter forces and procurement. There will also be representatives from the NATO Helicopter Committee who will discuss topics ranging from future rotorcraft designs and programmes, through to those more focused on technology developments to make military rotorcraft safer to operate in austere environments as well as addressing how tomorrow's helicopter will fit into the networked national and multinational force.

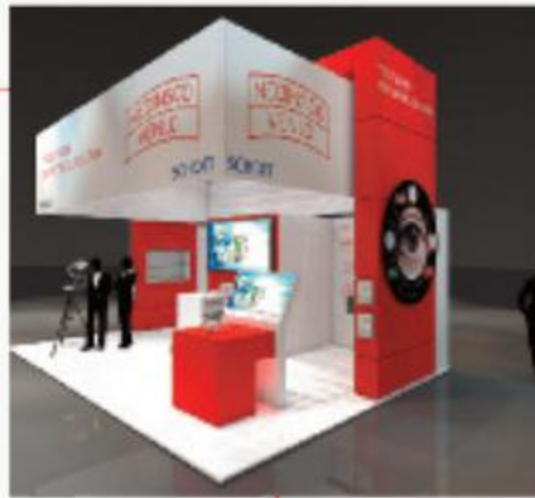
Theme: *Enhancing Rotorcraft Relevance in the Networked Battlefield*

Sub-themes:

Degraded Visual Environment, NATO Study
Next Generation Rotorcraft Capabilities
Manned Unmanned Teaming
Electronic Warfare Developments
Future Vertical Lift

REGISTER TO ATTEND THE 20TH ANNIVERSARY EDITION OF DSEI 2019 & THE DSEI STRATEGIC CONFERENCES AT WWW.DSEI.CO.UK/REGISTER

NEDINSCO is pleased to introduce the Back UP Sight.



VISIT US AT:
Stand 56-255
DSEI London 10-13
September 2019



ExCeL, Royal Victoria Dock,
1 Western Gateway London
E16 1XL



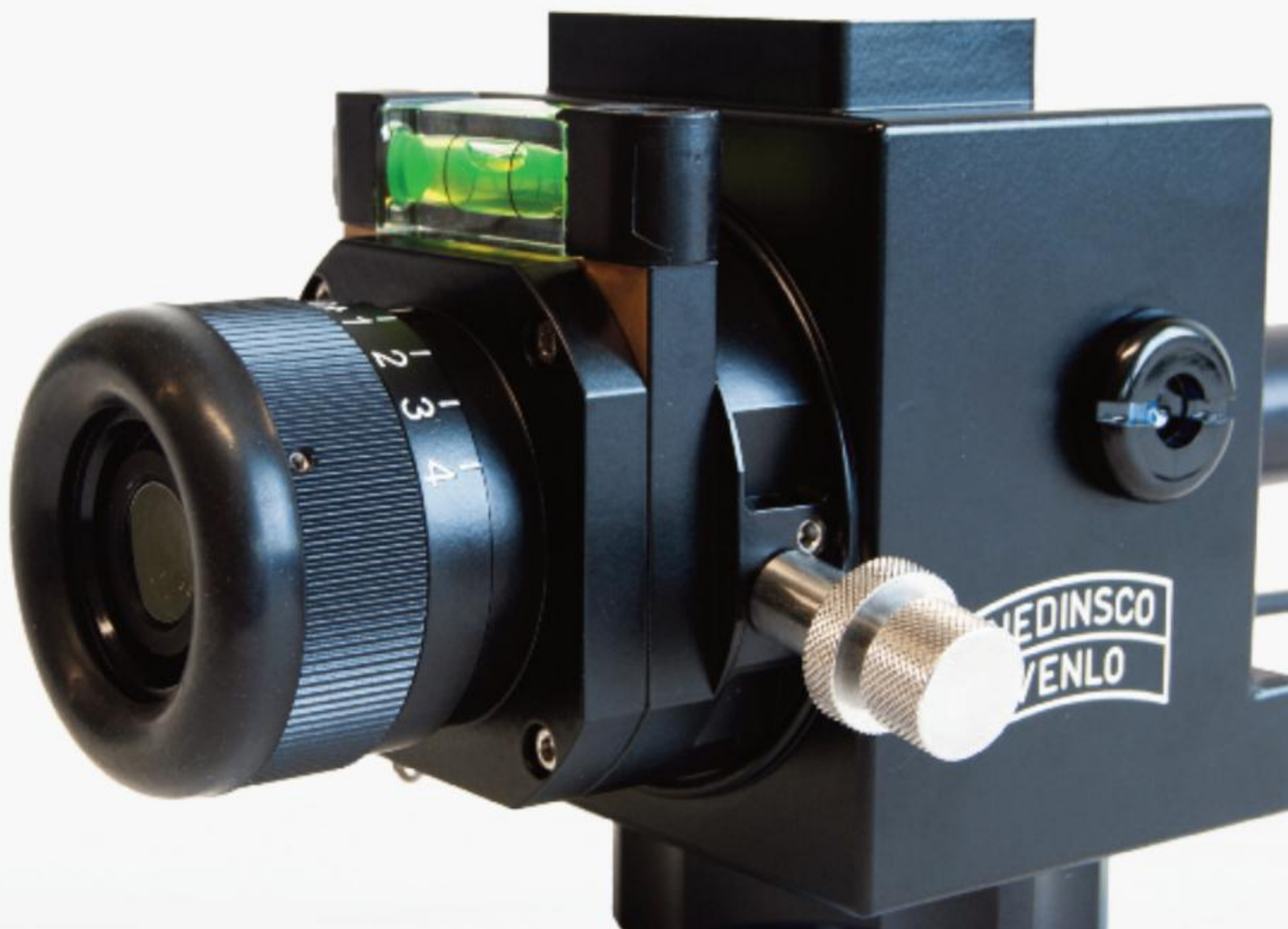


Product information Back Up Sight:

The backup sight is a direct-sighting device, it enables gunners and commanders of armoured vehicles, to observe and aim also during complete loss or degraded mode of electrical power in the vehicle. It is proven in field and integrated in existing new and retro-fit programs for armored vehicles. The backup sight is a modular system which can be tailored to every need.

Key features Back Up Sight:

- **Powerless auxiliary sight**
- **Gunner sight**
- **Commander sight**
- **Operates without power due to fibre optic transmission**
- **Direct sight: integrated reticle and laser filter**
- **1.8 m flexible high quality fibre bundle**
- **Less adjustments needed to the ballistic protection**
- **Situational awareness and targeting during power loss**
- **Easy / flexible integration in (existing) platforms**





Engineering Integrity



D S E I

10-13 September 2019

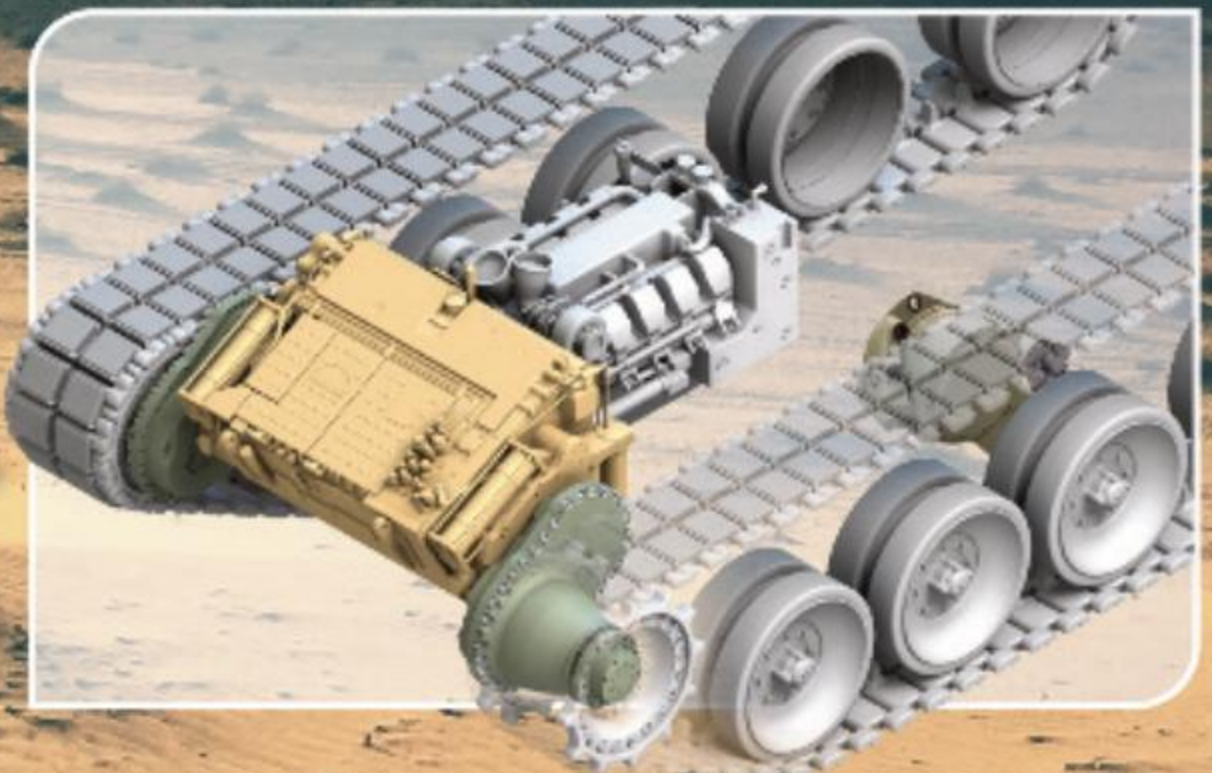
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Stand: **S2-326**

Horstman

With a time tested pedigree in design, development, project management and high quality manufacture, Horstman is the pre-eminent mobility solution provider in the global heavy armoured and tracked vehicle suspension market.





Horstman design, develop, deliver and support high-performance military vehicle suspension systems worldwide for the life of the vehicle.

Horstman is a British company with a global focus - specializing in design and manufacturing with an unrivalled domain experience in heavy armoured vehicle suspension. Boasting a time-tested pedigree in innovation, product development and defence management, Horstman are world leaders in the heavy armoured and tracked independent vehicle suspension systems.

With 140 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 that provides a quality, technically excellent offering to solve customers' problems, throughout the product lifecycle.

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.

Recognised by armoured vehicle designers worldwide as the benchmark for excellence in the field, Horstman works with more than 18 blue chip prime contractors and government R&D centres alike and our systems are in service in more than 28 countries worldwide. Horstman provides a strong systems engineering and design capability in hydropneumatic suspension, electronic and electro-hydraulic active vehicle ride management systems and has a strong supporting capability in safety critical high integrity manufacture (military thermal management, aerospace, and titanium components for sub-sea systems).



Horstman

UK: Bath, England

US: Sterling Heights, Michigan

Canada: Toronto, Ontario

T: +44 1225 423111

E: information@horstmangroup.com

www.horstmangroup.com

Horstman business strength lies in its foundation, its capabilities and the synergy of the multiple sectors and countries that our products are active in. Some of our products and capabilities include:

- **Hydropneumatic systems**
- **Hydraulic rotary dampers**
- **Conventional spring/damper systems**
- **Vibration isolation (seating, equipment)**
- **Gearbox and ancillaries**
- **Military Grade Air Conditioning Units**
- **Auxiliary Power Units (APU's)**
- **Air-hydraulic pumps**
- **Gas charging booster systems**
- **RPV landing gear**
- **Support equipment such as test rigs and associated equipment; track tensioners and hydraulic rams**
- **Torpedo hull & structures**
- **Non-magnetic actuators**
- **Instrumentation**
- **Commercial security and mining vehicles**
- **Globally deployed**

Horstman Suspension Evolution



Horstman proudly boasts the world's widest range of Hydrostruts® with retraction, lockout, ride height and semi/active systems



DEFENCELL

“Our strength is your protection”

DefenCell is a range of products that are designed and manufactured to provide protection for personnel, equipment and infrastructure against a wide selection of threats in the Security, Defence, Flood and Environmental sectors.

There are three main product groups in the DefenCell portfolio and a number of other complementary protection products available. The products are:

- **DefenCell Barriers**, non metallic cellular (Ballistic, Blast, HVM, UXO and Flood Protection),
- **DefenCell MAC**, welded mesh gabions (Ballistic, Blast, HVM and Flood Protection).
- **DefenCell Profile**, non metallic cellular (Hostile Vehicle Mitigation (HVM) Barriers, Berms)

Barriers

The DefenCell Barrier is the result of a decade long investment in research, development and testing to create

one of the most effective and versatile expeditionary protection systems available. A well-proven cellular construction combined with the strong geotextile material makes DefenCell a durable but lightweight and compact solution that is easily filled to provide protection to personnel and infrastructure from a variety of threats.

Designed by Engineers for Engineers, DefenCell is being used to provide protection to troops in harsh and often remote operational environments and is ideal for a wide range of Military and Security applications. Taking advantage of the small logistical burden of DefenCell's light weight and compact packaging, typical uses include protective walls, perimeter security, entry control points, ranges and training operations.

Profile

DefenCell Profile is our cellular Hostile Vehicle Mitigation barrier, developed with advice from the UK Home Office, extensively tested in UK and USA and approved by CPNI (Centre for Protection of National Infrastructure) in UK and Dept of State in USA. It is the only CPNI approved geotextile barrier

available and has been specified on many past, current and future security projects.

The increase in the threat from Vehicle Borne Improvised Explosive Devices (VBIED) and Hostile Vehicles has led to a need for effective protection systems to maintain maximum stand-off distance as well as blast mitigation in the event of an attack. DefenCell has been extensively and successfully tested against both VBIED and HVM and the cellular design dissipates energy along the length of the barrier very effectively.

DefenCell Profile is designed to provide perimeter security, from enhancing existing security systems and fences, to providing structural integrity to long perimeter barriers. DefenCell can be built to virtually any height and profiled to provide protection against specific threats. The Profile system has been successfully tested to UK PAS 68 Hostile Vehicle Protection standards and two standard versions are available to suit different threat levels. The ability of Profile to retain the suspect vehicle within the structure blocks a secondary attack.



Barriers



Profile



MAC

MAC

DefenCell MAC® is our range of protective welded mesh metal gabions lined with geotextile and supplied in several standard sizes and known in the US as the Expeditionary Barrier System (EBS). The EBS is available under long term contracts with US DOD and NATO procurement agencies and have been supplied to many other military forces, security services and NGO's

DefenCell MAC® gabions are filled with earth, sand or other locally available fill materials and provide ballistic protection, blast mitigation and HVM vehicle barriers. MAC can also be used for environmental applications and is ideal for flood protection.

DefenCell MAC® is constructed using the highest quality materials to established and tested standards by Maccaferri, the world's leading manufacturer of gabion structures, using heavily galvanised welded mesh panels combined with a heavy duty geotextile lining material created from UV resistant polymer fibre using the same advanced technology as the proven DefenCell fabrics.

Shooting Ranges

Recent projects in USA, UK, France, Africa and South America for Ranges using DefenCell, emphasise the excellent value and versatility of the products.

The Africa and South America ranges were both designed by Government authorities specifying DefenCell products. DefenCell has been approved by, and appears in the range design handbooks of, the National Rifle Associations in UK and USA.

UXO (Unexploded Ordnance)

Tested and certified for explosive containment, DefenCell has been approved by the prestigious US Dept of Defense Explosives Safety Board (DDESB). The requirements in the US for unexploded ordnance disposal are well documented as traditional ranges and training areas in US, Hawaii and other overseas locations are opened to public access and need to be cleared of old ordnance. This is usually done by certified civilian contractors.

Ongoing engagement by DefenCell experts with DDESB in USA and the NATO EOD Centre of Excellence in Slovak Republic maintain our solutions in the forefront.

NGO's and Civil contractors

DefenCell Barriers have been widely deployed by the various NGO in Somalia, S Sudan, Chad, Mali and DRC as well as several other global locations. The light weight and portability of the Barriers lends itself to remote and austere locations while the MAC is used consistently to build perimeter security as well as bunkers, observation posts, compartmentalisation and fuel & ammunition storage protection.

Flood

DefenCell T2 Barrier and DefenCell MAC FE 3 (Flood & Emergency) have both been successfully tested by ERDC and offer a lightweight and

proven solutions to flood, coastal erosion and critical infrastructure protection.

Civil Protection

Physical protection of critical infrastructure. The DefenCell Profile product range is ideal for both overt and discreet requirements. The products have been extensively trialled and tested to protect against specified threats including Vehicles, IED's, and holds Internationally recognised certification. (PAS68 etc).

Proven Customers include Power Stations, Fuel farms, Airports, Border and Immigration posts, Police Stations as well as oil and gas installations.

Testing

DefenCell products have been extensively and successfully tested during development against Ballistic Threats (Small arms to Rockets), Blast Mitigation, Speeding Vehicles, UXO (unexploded ordnance) and as Flood Barriers (both operationally and in laboratory conditions). An ongoing programme of further testing is part of the continued development of DefenCell products.

Support

Technical & Sales Support is provided by experienced Engineers with design and on-site installation advice supported by practical training and concise construction manuals and videos.

www.defencell.com

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S3-225



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UNITED STATES

401 Collins Blvd.,
Orville, Ohio USA 44667
Telephone: 330.682.7015
Mast Customer Service: 330.684.4000
Fax: 330.684.1190
Email: contact_us@willburt.com

GEROH

Fischergasse 25
91344 Waischenfeld, Germany
Telephone: +49-9202-18-0
Fax: +49-9202-18-11
Email: info@geroh.com

WILL-BURT TURKEY

2118. Cad. No: 4, B101
Mustafa Kemal Mah. 06530 Çankaya
Ankara, Turkey
Telephone: +1 202 820 2184

WILL-BURT EU

Unit 5b, Station Approach
Four Marks, Alton Hampshire,
GU34 5HN, United Kingdom
Telephone: +44 (0) 1403 265532
Fax: +44 (0) 1403 259072

SINGAPORE

1 Fullerton Road,
#02-01 One Fullerton,
Singapore 049213
Telephone: +65 6832 5689
Fax: +65 6722 0664



Aliter Technologies-High Speed Tactical Radio Communications



Aliter Technologies is an acknowledged expert in the area of ICT and software development. Its innovative work and quality has led to a portfolio of award winning products and solutions that are daily used by NATO and other international organizations, global technology companies and suppliers in the fields of security and defense, even in tactical environments.

In the Defense & Security area, Aliter Technologies delivers products and solutions intended for use by armed forces, homeland security, police, civil protection, emergency rescue teams, crisis management staffs, and other organizations involved in response to military and non-military crisis situations. The company solutions are designed in accordance with both NATO and international standards, and are rapidly deployable, highly mobile and autonomous in nature.

SOLUTIONS

- Tactical & Mobile ICT
- ICT for Special Operations Forces
- Crisis Management & Public Safety
- Ground-to-Air Communications
- Border Protection
- Industrial Drones

PRODUCTS

Aliter Technologies – COMTANET® Deployable ICT Modules – military tactical IP based voice, data and video teleconferencing services

COMTANET® of the second generation provides IP based voice, data and video teleconferencing services at military tactical command posts, as well as at temporary operational centers of civilian protection. This also includes the use and integration of various transmission means such as military radios, LOS radio relay equipment, civil radios, high-speed MANET radios, satellite devices, metallic and optical field wires, etc., thus building a comprehensive tactical communication network.

COMTANET® is available:

In a deployable light configuration in transport boxes fitted with appropriate ICT technologies or, as mobile command and control system integrated into technological containers and / or special command and control vehicles.

The core of COMTANET® consists of MIL-STD tactical ICT devices such as servers, routers, switches, power supply units, DC power distribution and UPS units, voice radio gateways, data radio gateways, high-speed MANET radios, media converters, line termination units, radio communication monitoring units, etc. The construction





of the devices allows them to be installed and used in military weapon systems such as tanks, combat armored vehicles, artillery systems, etc.

Aliter Technologies-VIMA – Virtual Mast for Tactical Deployment

VIMA (Virtual Mast) is a solution fully replacing the classic mechanical mast that is used as a carrier of cameras, antennas, radios and other devices and sensors for tactical deployment.

VIMA combines modern technologies with customer's high demands for quick set up in various environments, where is necessary to provide monitoring from higher altitudes than static mast is able to provide. Its take-off, flight and landing are fully automatic and it is possible to ensure its continuous operation thanks to the power from the ground station. VIMA can provide support for counter-terrorist operations, high-risk interventions (including increasing radio coverage at the site), traffic or border monitoring, monitoring of cultural and sporting events, etc.

Aliter Technologies-B2R 2nd generation high speed data radio

The 2nd generation of high speed data radio B2R (Broadband Radio Router) creates a high-speed tactical mobile radio infrastructure through MANET with Wave Relay® compatible radio network for simultaneous transmission of data, video and voice.

B2R is the ideal medium for use in fast deployable and highly mobile military tactical units due to the high tech functionality of MANET. With ever-increasing demand for transmission speed, B2R is also the ideal IP communication platform for deploying C4ISR systems into tactical environment.

Aliter Technologies-AT21201 Tactical Voice Communication Gateway

The AT21201 Voice Communication Gateway provides fully automatic and to the maximum extent unattended



transition from IP telecommunication networks to radio networks and vice versa. It is also possible to select the basic parameters of the connected radio station directly from the phone.

The radio gateway also enables automatic creation of radio retransmission and the connection of two telephone networks over the radio link. Optionally, a graphic PC application is available to monitor and control the operation of the radio gateway.

In addition to radio gateway features, the device also provides VoIP switchboard features and various analogue and digital voice interfaces.

Other Aliter Technologies Ruggedized ICT Tactical Devices

The AT10301 ruggedized Mobile Router is a high performance router built on Cisco 5915 ESR. The device provides reliable and safe routing of data via tactical mobile communication networks.

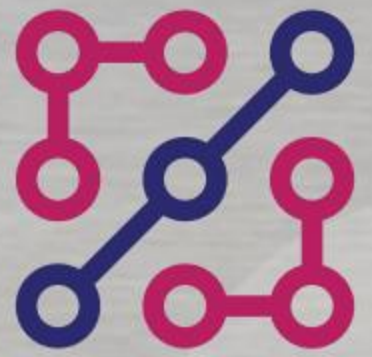
The AT10401 ruggedized Mobile i7 Server provides an excellent processing performance for tactical C2 applications.

The AT10201 ruggedized 10 port Mobile Ethernet Switch offers a reliable and secure data interconnection in the communication networks of highly mobile tactical units.

For more ICT devices see www.aliter.com or contact special@aliter.com.



CONCURRENT TECHNOLOGIES



New 3U VPX Processor Board



Concurrent Technologies announces their first VPX™ board based on the latest generation Intel® Xeon® E Processors

Concurrent Technologies is delighted to announce their first VPX™ processor board based on the Intel® Xeon® E-2200 processor family (previously known as Coffee Lake Refresh) just launched by Intel® for use in long life-cycle embedded applications. Air-cooled boards will be available for shipment in Q3 with rugged conduction-cooled variants due for qualification testing in Q4 this year.

The default variant of TR E8x/msd is fitted with a 6-core Intel® Xeon® E-2276ME processor running at 2.8 GHz with up to 32 GB of soldered down DDR4 memory and a rich assortment of I/O including on-board graphics. These features make it particularly suitable for supervisory compute, display and storage tasks in the military, aerospace, transportation and industrial markets.

Security is a key design requirement for this product – all TR E8x/msd boards are shipped with Boot Guard enabled to ensure that only firmware authorized by Concurrent Technologies can be executed. Secure Boot is also permanently enabled, so that the operating system and application software are validated before execution. A TPM 2.0 device is fitted to act as a secure safe for encrypted key storage. For additional

protection against external threats, Concurrent Technologies offers optional sanitization utilities or our proprietary security package to prevent against intrusion.

The board has been designed with a flexible PCI Express® (PCIe) configuration, to enable connection to several peripheral boards without a PCIe switch. The normal configuration has two x4 data plane ports with a further option to have up to three x4 data and expansion plane ports all running at Gen 3 speeds. An on-board PCIe switch has DMA and Non-Transparent Bridge capability to enable high throughput transfers and multi-processor board configurations.

Jane Annear, Managing Director of Concurrent Technologies, commented: ***"This latest board demonstrates our commitment to bring solutions to market at the same time as Intel announce new processor technology. While the main targets for this type of product are in the defense community, we now have customers using our VPX products in both utilities and gas & oil extraction applications that are benefitting from the inherent reliability and robustness of these products."***



Frequency Control Solutions

Greenray's excellent T1215 series TCXO Offers high performance in a rugged, hermetic package



Greenray Industries, Inc. has announced the availability of the T1215 Series TCXO.

The T1215 measures 9mm x 7mm x 2.8mm and features a hermetic, ceramic package with ruggedized construction. It has been designed to deliver consistent, reliable frequency control performance in high shock and vibration environments.

Reduced acceleration sensitivity down to $5 \times 10^{-10}/g$ is available for improved phase noise performance during vibration and acceleration.

The T1215 offers a wide range of available frequencies, from 750kHz to 800MHz, and a choice of CMOS, LVPECL or LVDS outputs. Supply voltage is 3.3V or 5V. A miniature, high precision AT strip crystal enables extremely smooth and repeatable frequency performance over temperature and time. The total integrated jitter over 10kHz to 20MHz is less than 3pSec RMS with an 800MHz output. Military screening is available to MIL-PRF-55310.

NEW T1254 series TCXO offers ultra-low G-Sensitivity for low orbit satellite applications

Greenray Industries, Inc. has announced the availability of the T1254 Series TCXO.

The new T1254 TCXO (temperature compensated crystal oscillator), available from 10 to 50MHz, features an extremely rugged, 20.3mm x 12.7mm DIP package, CMOS output and supply voltage of +5.0VDC. Acceleration sensitivity is $<7 \times 10^{-10}/g$ (std) or $<7 \times 10^{-11}/g$ (LG option).

The T1254 Series has been designed for low orbit satellite applications and offers reliable performance to 30krad radiation exposure.

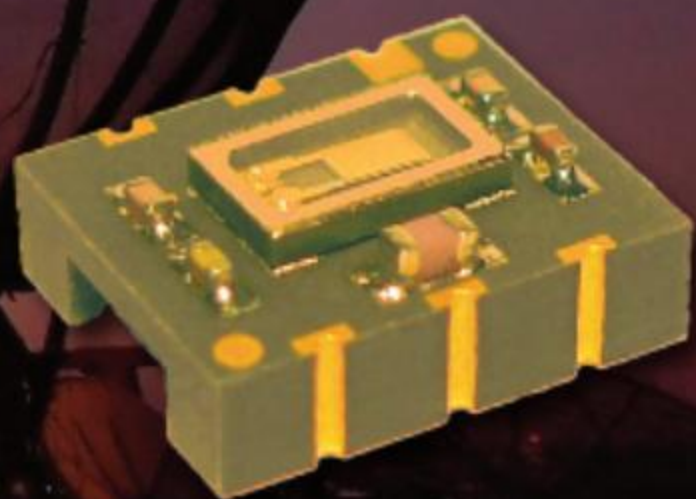


T1254 TCXO Environmentals:

- **Vibration:** per MIL-STD-883, Meth 207, Cond A
- **Shock:** per MIL-STD-883, Meth 2002, Cond B
- **Operating Temperature:** -40 to +105°C
- **Storage Temperature:** -65 to +125°C

The T1307 TCXO is supplied in a 9 x 7mm ceramic package supplied by our sister company AdTech Ceramics, with an industry standard footprint.

Utilizing a combination of proprietary crystal and oscillator design techniques, the T1307 offers g-sensitivity of $7 \times 10^{-11}/g$ of applied acceleration force. This is an order of magnitude improvement when compared with the best performance of commercial TCXOs, and enables customers to extend their system operating environment while maintaining spec-compliant operation. The T1307, when operating under random vibration, can offer phase noise improvements of more than 40dB compared to conventional TCXOs - and better performance than most OCXOs. The T1307 Series is 100% screened for g-sensitivity to ensure compliance with these rigorous specifications.



Greenray Industries is a leading supplier of high precision, quartz-based oscillators for use in wireless, wired telephony, aerospace, military, satellite, and other communications applications. Information regarding the T1215, T1254, T1307 TCXO's and all Greenray products is available at www.greenrayindustries.com.

Greenray Industries is certified to the ISO 9001:2015 + AS9100D standard.



PlastPackDefence

PlastPack Defence PPD

Development and production of lightweight packaging solutions

PPD is an innovative Danish company, serving the defence industry and specializing in the development and production of lightweight packaging solutions for military transportation, handling and storage of hazardous, high value and fragile goods according to military requirements.

PPD is active within two main areas:

Ammunition boxes, Lightweight plastic boxes/cases /containers for:

- Ammunition (small, medium and large-calibre)
- Hunting
- Fishing

- General Outdoor Purposes
- Pyrotechnics
- Explosives
- Countermeasures, Flares, etc...
- Weapons, etc...

Packaging solutions for Transportation, Handling and Storage of:

- Electronics
- IT equipment
- EO equipment
- Radar systems
- Spare parts
- Mechanical parts
- Aerospace parts, etc.

All products are tested according to relevant environmental standards such as, but not limited to: MIL-STD, STANAG / MOPI, DEF-STAN and the UN ADR convention.

Light Weight Ammunition Cases (LWAC®)

Logistical and Tactical Lightweight Plastic Ammunition cases for: Ammunition (small, medium and large-calibre), Pyrotechnics, Explosives, Countermeasures, Flares, and Weapons, etc...

PPD's new innovative LWAC® are based on PPD's newly patented design ideas and PPD's specially developed raw-material resins. PPD's LWAC® are designed as a full drop-in light weight replacement for existing systems, and accordingly meet all military requirements and standards.

The development and design has been performed in close co-operation with end-users and the ammunition industry.

The advantages are numerous however, the most important is the direct cost savings over the full life cycle due to:

- **Reduced weight, more than 68% lower than existing steel boxes. E.g. Packaging weight for 1.000.000 rounds 12.7(0.50 cal.) will be reduced by 16,5 tons!**
- **Improved stacking capability which allowing cross stacking both 90° and vertical stacking**
- **Improved thermal capability, with reduced heat transfer**
- **Prepared for built-in RFID tags for tracking and controlling**
- **Low noise during handling and contact with steel surfaces**
- **No risk of sparks**
- **Fully compatible with existing steel boxes**
- **Tested according to all applicable MIL-STD, STANAG / MOPI and DEF-STAN requirements**
- **UN- Approved, UN 4H2/21.5/S/15/DK/ETi-**



15003/PPD regulations (ADR convention) for safe land, air and sea transportation of hazardous goods

- **Fully recyclable / reusable**
- **Multiple color choice, e.g. color code according to ammunition type.**

Shipping and Storage Containers

Packaging solutions for Transportation, Handling and Storage of: Electronics, IT equipment's, EO Equipment's, Radar systems, Spare parts, Aerospace parts, Mechanical parts etc...

Complete range from 5.5–400+ Litres (60+ different models)

PPD is a specialist company supplying packaging equipment for transportation, handling and storage of goods accordingly to defence standards, such as MIL-STD 20-73, STANAG / MOPI 4280 and DEF-STAN 81-41.

PPD Packaging Concept

PPD has developed a packaging concept that can serve the defence industry with the correct type of packaging for every need.

PPD's concept is based on durable and ruggedized plastic cases and containers with options for foam inserts. The concept covers both one-way shipment of light and controlled transports, and fully ruggedized round trip shipment under extreme conditions, and up to 20 years of storage.

PPD is the exclusive Nordic representative of ZERO's product line:

- **TRANSITAINERS**
- **VAL-AN CASES**
- **MODULAR CONTAINERS**

Meets DEF-STAN packaging level P, N and J, MIL-STD level A and B, STANAG / MOPI level 1, 2, 3 and 4.

Contact PPD for an informal discussion about how we can best meet your needs.

DSEI
10–13 September 2019

The World Leading
Defence & Security Event
BoD&S, London www.DSEI.co.uk

Stand: N3/300

Lutra Associates Ltd

Helps PlastPack Defence (PPD) Of Denmark Carry Out 1.4s Bonfire Tests

It was a great pleasure to assist PPD carry out "bonfire tests" to help achieve UN Explosive Categorisation 1.4S over the last week for their Lightweight Ammunition Case (LWAC).

This United Nations internationally recognised test is part of an essential series of tests to allow certification to say the containers are safe to transport and store the various natures of ammunition in. It is a key part of the certification process of any ammunition container or package of ammunition or explosive of any type. In this instance the ammunition being tested was 5.56mm and 7.62mm small arms ammunition. The tests were carried out by Enhanced Performance Ammunition and Kynoch Ammunition.

Being made of plastic the revolutionary LWAC is a very new concept and government and civil ammunition suppliers and transport systems need reassurance that the revolutionary approach that LWAC



The bonfire with the witness screens in place. The LWACS can just be seen in the centre of the blaze. The fire has to remain at a certain temperature for a given period.



The search for the fragments of the ammunition and LWAC resembles a police scene of crime search. The LWAC remnants are on the metal hearth in the centre of the fire area.

offers is safe. Being plastic LWAC offers considerable weight savings (>10%) over the same volume of traditional steel boxes. This is a major saving in transport and logistic costs for governments and offers considerable operational benefits such as increased range for vehicles and aircraft. It allows Ministries of Defence in particular to make better use of defence money because it is not tied up in logistic support and can be allocated to combat capability. In addition there are considerable environmental benefits to using LWAC.

These trials involved the LWAC being incinerated in a large controlled fire and recording the consequences. The heat and flame causes the ammunition propellant to "cook off" ie explode. In doing so the explosions causes fragments to fly off in different directions at different velocities. In doing so some of the ammunition bursts open, some shoot off their projectile and some remain intact. The success or failure of the LWAC is determined by how successful it is in containing the fragments. Once the fire is out and

the embers are cool enough the location of the fragments has to be determined to see how far the fragments and projectiles have gone. Witness screens around the fire help establish the velocity of the projectiles. Finding the fragments is a painstaking process involving painstaking searches of the surrounding area akin to scenes from police at scenes of crimes films. The trials data will be forwarded to the Health and Safety Executive and MOD for their evaluation. Should they be satisfied they will issue UN recognised certification that LWAC can be used for transportation and storage of ammunition.

For more details contact;

Tim Otter
Chief Executive – Lutra Associates
The Byre, Red Lion Court, Church Hill,
STALBRIDGE, Dorset, DT10 2LR, UK

Visit **PPD** at DSEI 2019
– Stand **N3 / 300**.





OTUS

Vision at all conditions

New
Day/Night
camera system

- Safe driving: excellent vision
- Military Off The Shelf
- Non-ITAR components
- Multiple fusion modes
- Plug & Play
- Colour camera
- Integrated driving and distance lines
- User friendly
- Low system latency ≤ 25 ms
- Optional motorized protection cover
- Full HD camera

	VEHICLE	PERSON
DETECTION	1200 m ☀	225 m ☀
	880 m ☾	210 m ☾
RECOGNITION	500 m ☀	110 m ☀
	350 m ☾	80 m ☾
IDENTIFICATION	270 m ☀	60 m ☀
	185 m ☾	45 m ☾

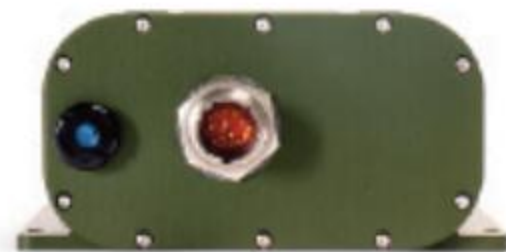




OTUS

Vision and

	VEHICLE	PERSON
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	350 m ☾	80 m ☾
IDENTIFICATION	270 m ☀	60 m ☀
	185 m ☾	45 m ☾



THERMAL IMAGER

Sensor (LWIR)	Uncooled 17µm
Image Size	640 x 480 pixels
Lens	Fixed FOV
FOV(h)	60°
NETD	< 50mk

DAYLIGHT CAMERA

Sensor (day)	1/1.8" CMOS
Image Size	1920 x 1080 pixels
Lens	Fixed FOV
FOV(h)	85°
Sensitivity	< 0.02 Lx

4 DI

- 0-1
- 0-1
- Edg
- Aut

S t all conditions



OTUS is housed in a weatherproof, hermetically sealed enclosure to coop with extreme environmental conditions. The absence of moving parts together with rugged parts, OTUS is suited for any application where reliability is a must.

DIFFERENT FUSION MODES

100% Blending false color
100% Blending monochrome
Image fusion
to (enhanced fusion)

SOFTWARE

Image functions	Contrast enhancement
Polarity LWIR	White hot / Black hot
Driving aids	-Distance lines (5, 10, 20, 50m)
	-Driving direction lines


FAUN[®]
 TRACKWAY

AWARD

Problematic and challenging ground conditions can affect the safe landing and take-off of helicopters in all types of terrain. The Helicopter Landing Pad (HLP) Role Packaging (MRP) solution transports and stores their renowned Helicopter Landing Mat, ready for a rapid deployment. The HLP is based on a 10ft ISO container which can be transported by land, sea or air, enabling expeditionary, humanitarian and disaster relief operations.

Once the helipad has been deployed, the MRP can then be used as an operational base, fitted with power, lighting and communications. It is available in both the PSA Flat Top and PSA Flat Top-R panel variants – both designed by FAUN Trackway[®] to create stable, tear-resistant and durable structures.

See it in action: www.faustrackway.co.uk



WINNING PRODUCT SHOWCASE AT DSEI

types of climates. To aid expeditionary forces to facilitate such operations, FAUN Trackway®'s innovative Multi-
d deployment. Showcasing its capabilities on the ExCeL's East Terrace (stand OD-20) at DSEI, the MRP solution
tarian and relief personnel to access all of the equipment and tools necessary to build a 15m x 15m helipad.

nting and air conditioning, as well as having room for sleeping spaces, storage and furniture. Compatible with
emporary landing surfaces capable of being laid in varying configurations to accommodate different helicopters.



The ONLY Space-Rated **Active** **Optical Cable** *Available TODAY!*



All the benefits of fiber with the ease & reliability of copper. Provides OEMs unmatched design flexibility.

In the spirit of Neil Armstrong's first step on the moon, AirBorn introduces another first in interconnect technology — **Space-Rated, Active Optical Cable**. Designed and tested to withstand the rigors of launching and operating in space, **SAOC®** revolutionizes space communication. Our rugged, non space-rated **RAOC®** version is also available — ideal for many Mil/Aero applications. Learn more: please visit www.airborn.com/aoc today!

 **AirBorn**

Another FIRST!

At AirBorn, we're still very proud to be a part of landing the first men on the moon and many other space programs since. Now, we are pleased to present another first — the culmination of more than 5 years of development, testing, overcoming setbacks, and rallying brilliant engineering minds toward answering our customer's challenge. Introducing AirBorn's SAOC® (Space-Rated Active Optical Cable), and RAOC® (Rugged Active Optical Cable), built on our proven, high-speed, MicroSI Micro-D connector platform.

SAOC® is the only fully tested and qualified, space-rated, flight-ready, active optical cable available in the market today. Optimizing the size and weight factors in the design, we made certain the SAOC® is ideal for spaceflight and the extreme conditions that come to bear during launch. Reliably connected in the heat of battle, RAOC® assures maximum durability, the kind demanded amidst intense battlefield or rugged & repetitive industrial conditions.

AOC Assembly — Best of Both Worlds!

- The Benefits of Fiber without maintenance & termination challenges
 - Improved length, data rates, EMI, weight & board space savings
- Design Flexibility - design box for both copper and AOC assemblies
 - Copper assembly can be used for short runs
 - AOC assembly can be used for longer runs
 - No transceiver to deal with
- Variety of Assembly Options
 - AOC to AOC
 - AOC to Passive Fiber
 - AOC with Power
- Applications: ANY requiring:
 - Higher speeds
 - Longer distances
 - Weight savings
 - Improved EMI
 - Hybrid power & optics
 - Easier maintenance
 - Design flexibility
 - Board space savings



Are you ready for an upgrade? Contact AirBorn TODAY!

Noptel launches new for the long distance rangefinder family



Compact Noptel laser rangefinder modules dedicated for OEM use by system integrators.

Noptel long distance laser rangefinder family has enlarged with new modules.

The small size open modules have waken huge interest among the system integrators since the start of the launch. Various system integrators have adopted the new rangefinder modules into their integrated systems and handheld devices.

Interesting part of Noptel laser rangefinder technologies are the middle range and long range laser rangefinder modules. These small size and light weight modules are provided for system integrators globally. The rangefinder modules exploit laser pulse flight time measurement technology, special cumulative measurement method and advanced signal processing techniques. By using this cumulative measurement method Noptel can exploit standard lasers and eye safe technology, yet reaching distance to several kilometres and at good measurement rate. Furthermore, the utilized technology allows competitive pricing and very small size of the modules.

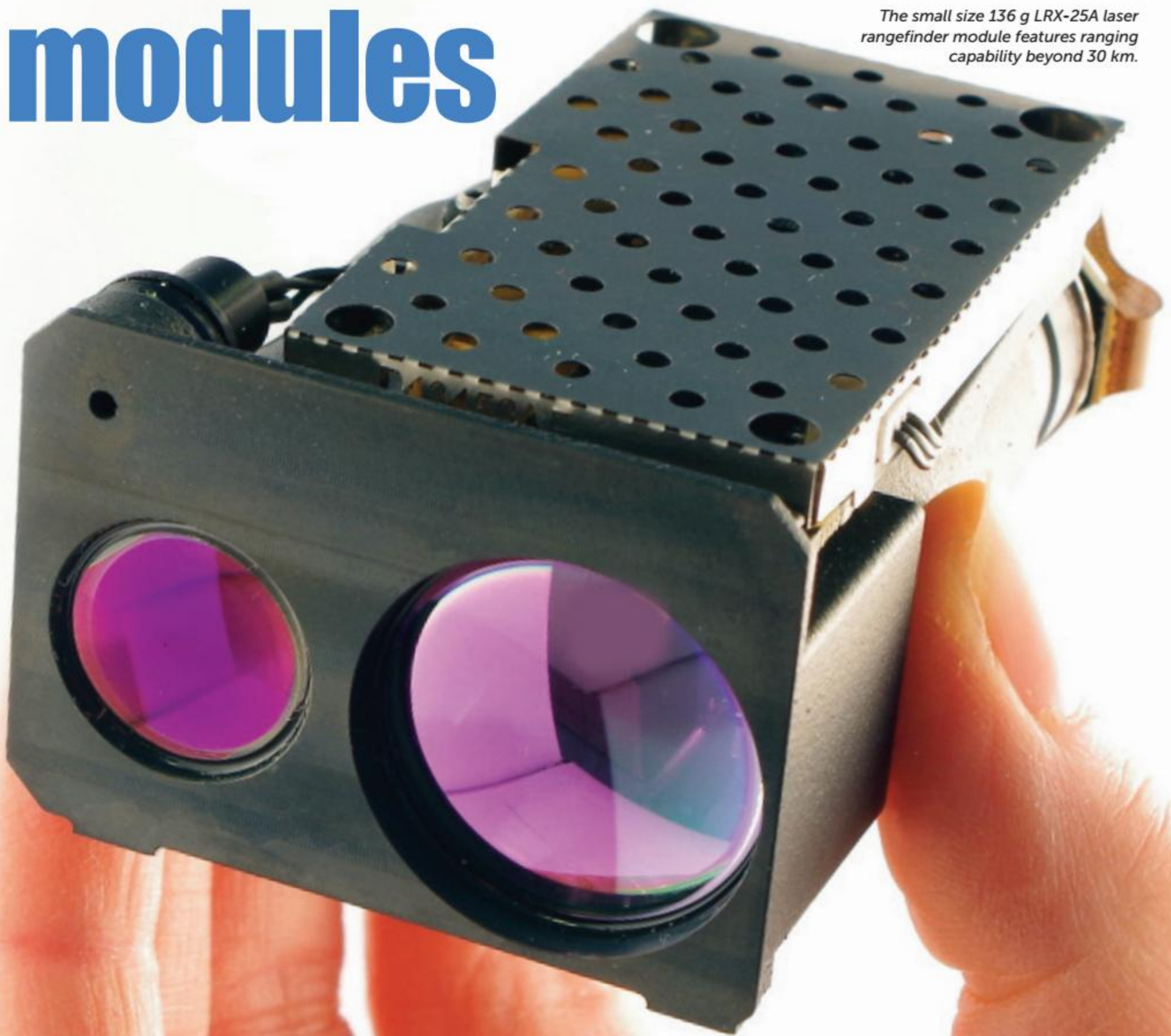
Noptel started to utilize the cumulative measurement technology in rangefinder modules in a project with a Belgian company FN Herstal,



The tiny 27 g LRF127 laser rangefinder module features ranging capability up to 4.5 km.

modules

The small size 136 g LRX-25A laser rangefinder module features ranging capability beyond 30 km.



with whom Noptel developed a state-of-the-art multi-technology fire control unit FCU. Today FN Herstal is 100% shareholder of Noptel.

Technology

The technology developed for the FCU has later been exploited in the Noptel LRF modules. The family of Noptel LRF modules comprises modules from tiny 27g module up to 200g module. Ranging capability for the smallest modules is up to 4.5 km and for the high performance modules beyond 30 km.

Applications

Typical applications for these modules are systems and handheld devices for thermal imaging, observation, surveillance, target acquisition, fire control and

reconnaissance as well as weapon sights and gimbals dedicated for drones and UAVs. The modules have been designed to operate as an OEM part of the complete system or device and controlled by the master unit. The modular structure of the modules allows mechanical restructuring of the modules, when necessary. This is especially important, when the available space in the master unit is limited.

Noptel will present the latest LRF technology and new modules at **DSEI 2019 in London on 10 – 13 September 2019.**

www.noptel.fi

Peli-Hardigg unveils its 60 years of experience

in Customised Advanced Case Solutions for the harshest environments

Peli-Hardigg unveils its 60 years of experience in Customised Advanced Case Solutions for the harshest environments

United Kingdom, July 2019 – Peli-Hardigg, the World's largest manufacturer of Military and Aerospace approved reusable plastic cases, describes its Shock-Proof Engineered Case Solutions. Peli-Hardigg Rotomoulded Cases can be customised according to each customer's needs while offering the best protection possible to any type of equipment, even the most fragile ones. With Peli-Hardigg Advanced Case Solutions, Mission Critical operations are a complete success.

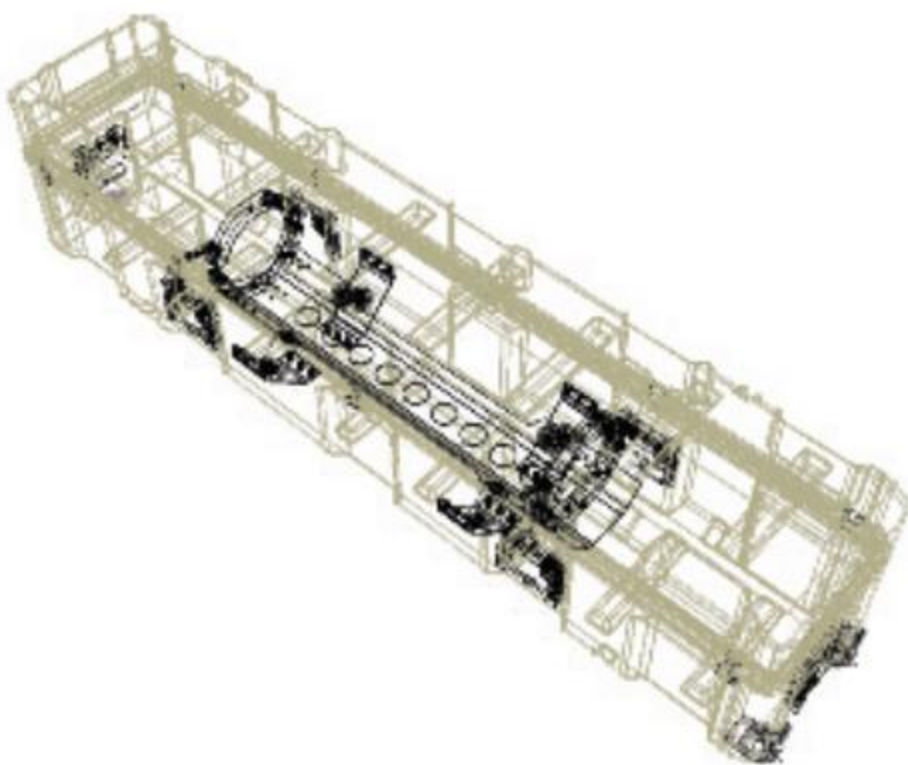
Peli-Hardigg™ - Over 60 Years of Expertise in Solutions for Mission Critical Operations

Mission Critical operations are defined as those where equipment failure is simply not an option; where preventing the snowball effect of a single breakdown means stopping potentially catastrophic failures down the line. Today's investment in the extreme protection of a custom protective Advanced Case Solutions pays off with Mission Critical equipment reliability over time.



Every facet of customisation from project management, customer relations, logistics, testing, engineering support and prototyping through final fabrication is handled within a comprehensive system to assure that failure is not an option. This unique approach brings a global presence to a regionalised dynamic to meet the custom solution needs.

Peli-Hardigg cases have been tested in the field as well as in combat situations. They are used to protect and transport aircraft pieces and engines, military diving scooters, all types of drones/UAV, weapons and missiles, satellites, robots, electronic equipment, among others. No matter the size and characteristics, Peli-Hardigg offers a solution to any company's need of safe transportation and extreme protection.



Peli-Hardigg's cases are rugged, watertight, airtight, chemical-resistant, lightweight, durable, impact-resistant and reusable. They are designed to efficiently keep the sensitive and vital equipment safe from moisture, dust, sand, salt and impact. Safe inside, the equipment is protected against drop damage, while the rib design maximises stacking and stability en route.

By developing custom solutions, testing new materials and continuously improving designs based on user feedback, Peli-Hardigg has been able to build a robust line of cases that proudly live up to the harsh demands of the military, aerospace and other industries.

The 4 stages of Custom Engineering –

"In a project there are 4 main stages: evaluation, design, testing and manufacturing. With advanced 3D engineering software we visualize before manufacture how the container will look like from every side and angle. We can also check for any critical interfaces, like checking the shock mount fit and that the plates are well fitted, and how the container will fit around that frame." Explained Phil Morrison.

Advanced Case Solutions are the result of a multi-disciplinary, four-stage process. Working closely with the customer Peli-Hardigg's engineers can customise every point of the protective system from shock and vibration attenuation to impact protection and operational logistics according to the product specifications, usage and environmental analysis.

Peli-Hardigg's internal team have long-term experience in designing everything from simple foam cushions to extremely complex metal structures for use in dramatically diverse shipments, storages, and use conditions – including military deployments and combat situations. From deck-mounted equipment to bezel-mounted electronics with integrated exhaust fans to cases with multiple access points and interface





portals or extended-profile customisations – no case requirement is beyond Peli-Hardigg capabilities.

For more information visit:

<https://www.youtube.com/watch?v=V86klPyKNTQ>

Advanced Case Solutions Certifications and Approvals -

IP67 – water resistance and dust ingress
Air Transport Association - Spec 300 Category 1
MIL-Std 810, def Stan 81 41 Level J – Tests reports available to certify military standards

Peli-Hardigg offers Fully Configurable Min Mac Rack™ Cases coming with a Shorter Lead Time and New Military Certifications

Entirely manufactured in Europe and designed for defence usage, Peli-Hardigg's Min Mac Rack Cases are available with a short lead time of only 4 weeks. After successful completion of new military test certifications for drops (MIL-STD-810G), water immersion (IPX7) and dust ingress protection (IP6X), this feature-rich rugged case line secures its protection leading value.

The renovated Peli Min Mac Rack range is available with 5 different frame heights (4U, 6U, 8U, 10U and 12U), each available with 2 different rack lengths (480 and 610mm), making a total of 20 configurable ready-to-

order rack cases. Designed to meet prime military standard requirements (such as MIL-STD-810G), it answers the need of making the most of limited space, while providing rugged protection for the equipment.

The lightweight, compact design of the Min Mac Rack double-ended cases, offer light to medium duty protection and boast industry leading shock performance. It's the perfect companion for aerospace and defence use.

The Min Mac Rack angled precision-engineered elastomeric shock mounts are fine-tuned to match the weight and fragility of your equipment. This ensures maximum shock and vibration isolation. The high-strength, lightweight, heat treated, square holed steel rack frame of the Min Mac Rack provides a range of mounting options for single or multiple fragile equipments.

Highlights of the Min Mac Rack container -

- *High-strength steel rack frame supports equipment from 10-50 kg*
- *Laboratory tested G Fragility rating of 50-80 G*
- *Peli-Hardigg patented, wide-design, Comfort Grip Handles™ make lifting easy*
- *Patented, positive anti-shear interlocks minimize stress on hardware and prevent case lids and bases from separating, even after impact*
- *Molded-in, tongue & groove gasketed parting lines seal tight and remain so after impacts*
- *Designed to meet ANSI/EIA-310-C for universal rack mounting hole pattern*
- *Designed to meet the requirements of Def Stan 81-41 Level J, Mil Standard 810, STANAG 4340 and other European standards*
- *Inter-stackable design*
- *Fully configurable: multiple accessories and options to adapt it to the different needs of customers*
- *Different colours to choose from*
- *Multiple accessories available: edge casters, drawers & shelves, interlocking catches, card holder, custom labels, among others*

For more information:

<http://www.peli.com/eu/en/products/rack-mount-hard-cases/#min-mac-rack>



THE ULTIMATE STORAGE FOR YOUR MOST CRITICAL DATA



Data Bunker

YOUR OWN SAFE & SECURE "BLACK BOX."



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Made in the USA with clean electronics. Virtually indestructible.



THE ULTIMATE STORAGE FOR YOUR MOST CRITICAL DATA



Data Bunker

Organize vital records and information and protect them from Fires, Floods, Tornados, Hurricanes, Earthquake, Building Collapse, Cyber Criminals...

Your own safe & secure **"Black Box."** The ultimate storage for your most critical data.



The DataBunker product line is a breakthrough for transportable critical data storage. Its small compact size has incredible survival capabilities. It is actually small enough to fit in a standard briefcase and is TSA approved for carryon.

It is designed to withstand a crash event were there are high G forces followed by a horrible chain of events including a penetration attempt, 25,000 lb. crush resistance, a 1400 degrees Fahrenheit one-hour fire, a 500 degrees Fahrenheit for 10 hours, 48-hour submersion in diesel fuel, 10 min under fire fighting solution, and then a 48-hour submersion under 15 meters deep in salt water in sequence on the same unit. The DataBunker also survives a nuclear weapon EMP.

Many applications are showing themselves for the DataBunker product line from black boxes for many different types of vehicles including trains, busses, trucks, cars, self-driving cars, emergency response vehicles, cash transport vehicles, military tanks and all other military vehicles to personal home use. A DataBunker on a vehicle allows you to extract the data of an event that occurred so accurate reconstruction can occur, this is especially of interest when loss of life has occurred with a vehicle accident, or to just have your personal critical information survive most any "event".

For personal data protection in today's world where the "cloud" is hacked every day where do you put your critical personal information and data that is not going to be destroyed if an event happens. All your personal information and vital data should be protected and accounted for. Wills, financial information, and insurance policies can disappear if you don't protect them. This is poignant and everyone must do this to protect themselves and their loved ones. Whether you are a fortune 500 company or a family or an individual you need to protect your valuables. Many of our valuables in this era are now data and information.

The DataBunker is designed to protect that and organize your life at the same time. It comes already loaded with a complete file folder system that is expandable to accommodate any of your needs. Useful documents such as wills, power of attorney and many others are already on it and if you are a bitcoin or any other form of cryptocurrency holder why you would hold it on anything else. It shows up as a drive on your computer and is as easy as dragging and dropping files on to it. We also have our easy to use but very powerful encryption software BunkerCrypt.

Put your world on a DataBunker today. Organize your life on a DataBunker today. Do it for your yourself or your love one's sake.

Go to **DataBunker1.com** and order your DataBunker today! Many colors available, 8, 16, or 32 gig.



Tel: **866.741.5458** Website: **DataBunker1.com** Email: **Sales@DataBunker1.com**

Challenges of 21st Century Military Operations

in Complex CBRNe Environments

By Professor David Crouch

A CBRN environment, from a military perspective not only includes the actual CBRNe threats and hazards present themselves, but also their potential effects on ongoing defence operations. These effects can be created through the intentional or unintentional release of CBRNe materials in the operational environment (OE). The OE is the combination of the conditions, circumstances, and influences which will determine the use of military forces and help a unit commander make decisions. What type of operational environment the force element is operating in, can be a very complex equation when CBRNe agents are also a consideration? For example, are we operating in a hostile, permissive or uncertain CBRNe environment? Is the type of terrain a complex or challenging environment e.g. urban, subterranean or desert terrain?

From an Individual Protective Equipment (IPE) perspective, the modern soldier faces unique risks in operating in environments with unknown CBRN contagions. As although their protective ensemble normally reflects a very high level of protection, including state-of-the-



figure 1a

art CBRN respiratory protection, not all military respirators are effective in say confined spaces, where there is not enough oxygen in the air you breathe to support life, e.g. covert CBRNe weapon storage facilities or underground terrorist bunkers (Figure 1). Under such circumstances, one size most certainly doesn't fit all when it comes to Respiratory Protection Equipment (RPE) selection for such challenging environments. IPE/RPE solutions must therefore be flexible enough to allow for military operations in all types of terrain and climatic conditions.

The modern respirators such as the General Service Respirator – Evolution Specialist (GSReS) from 3M, can cover a wide range of Concept of Operations (CONOPS) and threat scenarios, providing both



figure 1b

positive and negative pressure capabilities within the single respirator face piece, and as a system it is also designed to worn with a range of IPE ensembles including CBRN clothing (Figure 2).

Combined with the urgency and a need for rapid action should such CBRN agents be encountered on the battlefield, the importance of effective communication during such an event, including identification of challenges and possible pitfalls before crises occur, goes without saying. Therefore, nations such as the U.S. have placed increasingly significant importance on information superiority as one of the keys to prevailing in conflict against other forces throughout the world. As even under challenging CBRNe conditions "maneuver" will still be an essential element of combat power. Improving "Operational Tempo" in such hostile and restrictive CBRNe operating environments, can only be achieved through enhanced shared situational awareness.

For example, the deliberate release of Novichok nerve agent in Salisbury, UK in March of 2018 not only resulted in a human fatality and contamination of significant areas of land and infrastructure around Salisbury, but it also required defence forces to operate under a "Military aid to the civil power" (MACP) type footing in the UK. If the required dynamic and joint approach by the defence forces and other national response agencies is to be delivered in an effective and timely manner for such events. Then a domain where information exchange is critical to mission success, needs to include improved end-to-end shared situational awareness from individual soldiers all the way up to command HQ level.

However, the high levels of protection necessary to protect the modern soldier in an ever changing CBRNe environment can, potentially, result in a combined IPE ensemble that is burdensome and poorly integrating with other mission critical equipment or that it inhibits individual communications with the outside world (Figure 3). For example, full facepiece respirators can interfere with visual cues when speaking and listening. It thus becomes more difficult not only to recognise what is said, but also who is saying it.

Distance and intelligibility are interrelated; longer distances between communicating sections can result in less intelligibility. This latter facet is significant when one considers the size of operational safe distances utilised in military operations, especially in subterranean environments, where safe cordons of up to 300-500 metres could be typical for some decontamination operations. Command and control is difficult in any operation encompassing CBRNe agents particularly built-up area; periods of limited visibility increase this difficulty.

Unless designed correctly, a soldier's IPE ensemble may inhibit personal communications, and this needs to be considered before carrying out any CBRN hazard management activities e.g. "you cannot fight if you cannot hear" Special communication equipment is now available from leading RPE manufacturers and some respirators now have speech diaphragms incorporated into the mask or are made of materials that enhance speech transmission. For example, the speech diaphragm incorporated within the GSReS (Figure 4) is situated directly in front of the wearer's mouth and is designed to minimize speech attenuation. Through its unique design, the communication system on a modern respirator such as the GSReS can be augmented via a Voice Projection Unit (Figure 2b), which simply clips onto the respirator's internal speech diaphragm and amplifies the speaker's voice, enabling it to be heard at distance

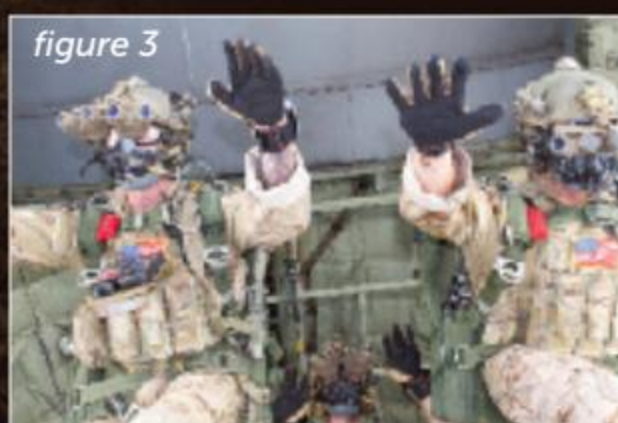


figure 3

more clearly. Whilst integration into a secure radio-communications network can be achieved through the addition of dynamic or electret microphone and "Push to Talk" or radio array, as depicted in Figure 3, with connection to a Peltor-based communications headset from 3M.

Dedicated communications systems such as the PELTOR COMTAC Tactical Communication Headsets from 3M have the added advantage of an environmental listening feature (level dependent functionality) for auditory situational awareness and face-to-face communications. Environmental Listening is a means of allowing low level sounds to bypass the individual hearing protection while still protecting against the harmful peak sound pressure levels likely to be encountered by defence forces in a kinetic environment (Figure 5). Whilst sound amplification allows the user to hear low-level sounds, including range commands and conversation. Further demonstrating how important holistic IPE selection is when considering Counter-CBRNe operations.



figure 5

As although the above RPE solutions were originally intended to meet the exacting threats generated from the Cold War, the 21st Century Soldier is now faced with an ever-shifting CBRNe threat spectrum. Modern respirators such as the GSReS have evolved accordingly and are now capable of not only delivering their primary life-saving function, but also acting as a common architecture platform with which to integrate other mission-critical infrastructure, such as communications systems and other IPE

About 3M

At 3M, we apply science in collaborative ways to improve lives daily. With \$32 billion in sales, our 91,000 employees connect with customers all around the world.

The UK and Ireland is home to one of the largest 3M subsidiaries outside the USA, employing 2,900 people across 18 locations, including nine manufacturing sites.

Products manufactured in the UK include coated abrasives, personal safety equipment, adhesive tapes, industrial microbiology products and drug delivery systems.

Learn more about 3M's creative solutions to the world's problems at www.3M.co.uk or follow @3M_UK on Twitter.

figure 2



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microphone to 3M™
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Always read and follow User Instructions and ensure proper fit and PPE compatibility.

PARK AIR DEFENCE COMMUNICATIONS

Park Air Systems Limited has over 30 years' experience in providing defence and military radio systems for surface-to-air communications around the globe.



Park Air Systems Limited has over 30 years' experience in providing defence and military radio systems for surface-to-air communications around the globe. Park Air radios have formed the backbone of communication systems for a multitude of defence requirements, from traditional national air defence networks, to complex ship-borne systems and compact deployable cabin

operations. Drawing on extensive experience within global civil Air Traffic Management (ATM) sector, Park Air also support the design of split-site ground stations for maximum range and clarity of communications.

The Park Air Onyx Communications Portfolio provides all of the components required for fixed, maritime and deployable surface-to-air defence communications systems. At the heart of the Onyx offering is the Park Air M7 VHF/UHF range of software defined radios, providing voice, data, secure speech and electronic protection measures (EPM) capabilities.

The modular construction of the Park Air M7 radio allows configuration to meet the operational needs of a diverse customer base and, depending on the requirement, the radio can configured to either be a Receiver or Transceiver. Additional hardware modules are available to add a local or remote control head, guard receiver and NATO standard or non-NATO EPM functions.



The Park Air M7 radio has been designed specifically for demanding defence applications, offering features and benefits that include:

- *50W continuous power output in AM voice mode and 100W in FM voice and NATO/non-NATO EPM modes, even in severe environments.*
- *Multiple voice and data waveforms available, anticipating the tactical communication needs of military users - including AM/FM voice, wideband AM/FM data, Link 11 and international maritime.*
- *Modular construction, enabling field maintenance and upgrade. Custom interface port also facilitates customer-specific upgrades.*
- *Continuous tuning from 100-400MHz.*
- *The small form factor allows more channels to be housed in the available cabinet space, particularly important where space is at a premium, such as in naval and transportable applications.*
- *Optional EPM modules include non-NATO Talon, and NATO Have Quick and Saturn waveforms.*
- *Enhanced security through role-based access control means that each user can only access the radio functions that they are cleared to operate.*
- *Military standard environmental and Radio Frequency immunity compliance for fixed site, deployable and shipborne systems.*

Complementing the Park Air M7 radio is the Park Air M7C Radio Controller, a full function controller for up to 8 radios in the VHF/UHF range. To ensure continuity of user interface for ease of operation, the controller replicates the design of an M7 radio front panel. The design of the Park Air M7C Radio Controller eliminates the need for a dedicated voice switch for controlling up to 8 radios from a single controller position.

Easy configuration over customer networks is achieved using the Park Air R4 MARC Server remote control and monitoring system, which is also used within the class-leading Park Air Sapphire Civil Air Traffic Management portfolio. The Park Air R4 MARC Server boasts a simple web interface, remote testing and monitoring, coupled with a suite of software and hardware options, providing maintainers with the ability to monitor and interact with all radio devices on their analogue or digital network.

All elements of Park Air solutions are designed with ease of maintenance in mind, to reduce engineering overhead and maximise operational availability. Due to company confidence in the equipment, a standard 2 year warranty is offered on all Park Air supplied equipment. Extended warranty options of up to 5 years are also available upon request.

Park Air Systems Limited has been at the forefront of civil ATM and defence communications technology for many years, with a company heritage going back to 1966. They led the way for the VHF Data Link (VDL) Mode 2 and VDL Mode 3 data standards and Park Air are



a current and active member of industry leading groups such as EUROCAE Working Group 67, helping to define the future of IP standards for radio ground networks.

In 2016, the doors to the Park Air Training Academy opened, allowing them to expand the customer training offered and the range of ATM courses available.

Training courses are specifically designed for professionals responsible for the acquisition, installation, support and maintenance of ATM communications systems, covering both civil and defence products. Courses are developed by in-house technical experts, including product design specialists and field support staff. All courses are delivered by professional trainers with extensive ATM communications experience.

Park Air believe that collaboration and partnership are key in delivering unrivalled quality and reliability in all of their systems. Aiming to provide flexibility with all product and system designs, the company can develop and build truly unique surface-to-air communication systems to meet your specific operational and infrastructure needs.

For more information on Park Air Systems Limited, or how their products could benefit your installation, please visit:

<https://www.parkairsystems.com/defence-communication>



PARK AIR

SCHROTH MINE BLAST & UTILITY SEAT SYSTEMS



The SCHROTH Mine Blast Protected Seat Systems are tubular lightweight systems with a unique resettable Energy Absorbing (EA) system designed into the seat.

The EA design and technology comes from the years of experience SCHROTH has with energy management in seatbelt systems. The design of the seat gives the occupant not only excellent protection in a mine blast

event, but also offers excellent protection in the event of an accident or impact. The All Belts to Seat (ABTS) design allows the vehicle manufacturer to optimize the installation of the seat within the hull. An integrated footrest can also be incorporated into the seating system for additional lower-leg protection. The unique SCHROTH EA technology is tunable to match the size and weight of the vehicle as well as the level of protection required and the available space within the vehicle interior. The EA is also designed to reset itself and offer high levels of protection for the secondary (slam down) event.

SCHROTH®

The Mine Blast protected seating system is available in two versions:

- SU-62 compact forward- or rear-facing seat
- SU-63 side-facing seat with full or side specific headrest for exceptional side impact protection

The SCHROTH seating comes standard with an ECE certified lightweight 4-point harness restraint. Restraint systems with ECE complaint 5-point seatbelts are also available.

SCHROTH offers the ideal system for military personnel & troop transport configurations.

KEY FEATURES

- Quick release, wall-mounted interface
- Modular construction
- Spring Loaded Self-Folding, storable seat pan

CUSTOM APPLICATIONS

Our lightweight seat systems may be adapted to many ground vehicle applications. We can assist with interface, integration, installation and ergonomic requirements as well as any vehicle specific seat modifications that may be required.

Contact:

Mr. Julian Schulte

Tel: +49 2932 97420

E-Mail: Julian.Schulte@eu.schroth.com



NIC

INSTRUMENTS LIMITED

"EOD solutions for life..."

NIC Instruments Ltd. is a British design and manufacturing company that has been supporting worldwide security forces since 1970, developing equipment to support organisations involved in the defeat of Improvised Explosive Devices (IEDs) as well as all forms of unexploded ordnance from conventional munitions to legacy minefields and chemical or biological attacks.



Today, NIC concentrates on Explosive Ordnance Disposal (EOD) including Counter IED and Chemical Biological Radiological Nuclear and explosive (CBRNe) detection capabilities.



Extensive Product Range

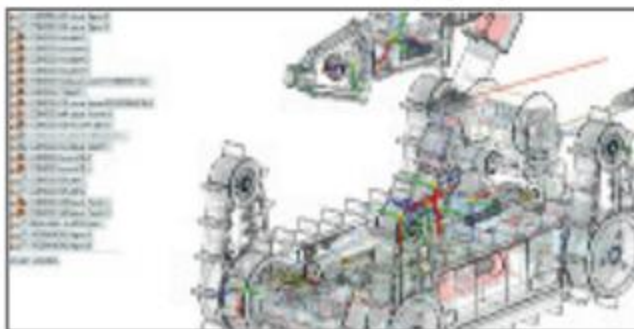
NIC's product's capability range from

- Remote actions utilising "ZEUS" unmanned ground vehicle (UGV).
- Semi Remote using Hook and Line, a simple lightweight system for moving items that might be booby trapped.
- Advanced Manual Techniques where operators literally 'cut the wire' to make safe suspect devices.

Custom Solutions

But NIC does not just make a range of standard equipment, its expertise is in adapting its existing products to suit the requirements of customers.

NIC has a full design team, able to realise the requirements customers need and fill their capability gaps. By working with end users, NIC can adapt existing designs or even come up with whole new designs to solve customers problems. Backed up by one of the worlds most advanced manufacturing capabilities, NIC is able to deliver a turn key project.



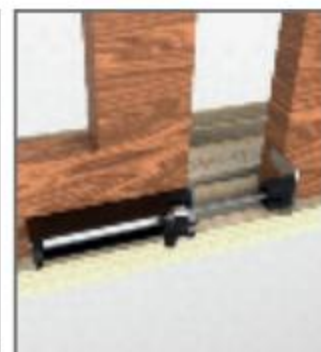
In a recent CBRNe project, NIC took the sensors that the customer already had in service and adopted them to be mounted on ZEUS to enable remote sensing. This kept the operator well away from the hazardous areas as the sensors could be fully controlled from the robot controller. Furthermore, the data from the sensors was then passed out of the controller to a central command and control system that also took in data from other sources such as weather and maps. Combined, this



data is able to give a threat assessment of an attack and allow security forces to take the appropriate action in the surrounding areas such as evacuation.

Large & Small Projects

But NIC don't just work on big complex problems, NIC solves simple problems as well. In a recent project, a European EOD team had developed a simple tool to push doors open remotely. The concept was good but needed refining to be reliable and work in a wider variety of situations. NIC took the concept and developed it into a fully function tool now deployed within that country's special forces.



Based in the UK, NIC Instruments is committed to designing and manufacturing in the UK. At the heart of NIC is manufacturing, but not just any manufacturing, manufacturing to support security forces in the defeat of terrorism. That's their raison d'etre.



For further information, please contact us:

NIC Instruments LTD
Gladstone Road,
Folkestone,
KENT,
CT19 5NF, UK

Tel: +44 (0)1303 851022

email: sales@nicltd.co.uk

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An army marches on its stomach



Electrothermal is a UK-based company that manufactures and designs water and ration heaters for military vehicles. Our heaters are designed for operations on the move and can fit into the cramped quarters of a tank, or other military vehicles, to provide necessary sustenance to the soldiers on-board.

Key features:

- Heats 2 pints water and 5MREs in the vehicle while on the move
- Contents remains hot for up to 6 hours after the unit has been switched off
- "Cool to touch" outer casing
- Designed-in "Boil Dry" condition and fail safe mechanisms
- Connects to vehicles auxiliary power supply, 24 volts DC
- Heating range 66 to 71°C (on LO setting)
- Heating range 82 to 88°C (on HI setting)
- Ramp rate of 56°C in one hour (max) from ambient temperature of 21°C

www.electrothermal.com

Caution
Parts may be hot



This system is designed to
ONLY HEAT:
- Make Ready to Eat (MREs)
- Reheat components of food
- Drinkable water.
This system will NOT cook, boil, or
dry foods, and it will NOT disinfest
or decontaminate water.
The REMOVABLE CONTAINER and
HANDLE will be extremely HOT.
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Do NOT use removable container for
personal hygiene (shaving, washing, etc.).
Use only APPROVED cleaning methods
as defined in the technical manual.

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- RAK 15: operates off 15A and is designed for installation in tanks and trucks
- RAK 30: draws 30A to heat faster and is designed for the marines and special forces

Food and water heaters for modern military operations

RAK15/30 units are designed to withstand the rigours of modern conflict and have been comprehensively tested to meet military standard specification MIL-PRF-44466D, MIL-STD-461 and MIL-STD-810. They are also certified for food heating after meeting NSF ANSI 4-2013.

Constructed from a robust stainless-steel outer casing, the unit is sealed to be water-tight, so that any steam is retained within its interior. It has both low and high temperature settings and its own built-in control, so that a separate control unit is no longer necessary. The choice of heating ranges is either 66°C - 71°C (on LO setting), or 82°C - 88°C (on HI setting).

For more information or to receive a quotation, contact:

Antony Wozniak, Category Manager on +44 (0)7770 014607
or via email at antony.wozniak@coleparmer.com

PPM Systems Becomes Regular Donor to Bomb Disposal Charity

The Felix Fund, a UK-based bomb disposal charity, will have its finances boosted thanks to defence suppliers, PPM Systems.





The charity helps British military or SO15 (Metropolitan Police Counter Terrorism Unit) personnel who have conducted or assisted with Explosive Ordnance Disposal (EOD) and search duties, by providing financial assistance and welfare support. It helps serving personnel, veterans and their dependents.

"We are massively grateful to PPM Systems for choosing to support our work with regular donations. This will enable us in helping more men and women from the bomb disposal and search community," said Melanie Moughton, Felix Fund Chief Executive.

Shrivenham-based PPM Systems specialises in RF over fibre systems for Signals Intelligence (SIGINT) and Communications Intelligence (COMINT) applications. It also supplies antennas, software-defined radio, RF filtering and conditioning products, EM spectrum and decoding receivers, and IED/ECM defeat systems. The company works to design and supply complete, customised systems to the defence sector and military personnel.

For more information, please visit www.ppmsystems.com and www.felixfund.org.uk.



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Rise of the PHOENIX

Delivering Enhanced Range Target Location & Engagement

The image features two grey, boxy Visual Augmentation Systems (VAS) units, one positioned above the other on the left side. They have large circular lenses and various ports. To the right, a portion of a gun barrel is visible, pointing towards the right. The background is a dark, smoky field with bright orange and yellow flames at the bottom, suggesting a battlefield environment.

With the ever increasing requirements to engage targets accurately and effectively at greater ranges, coupled with performance developments in weapons and ammunition natures - providing the ability for trained operators to defeat targets at those extended ranges, the challenge once more reverts back to the Visual Augmentation Systems (VAS) to ensure that capability can be exploited 24hrs a day under a range of environmental conditions.

PHOENIX – The Evolution of a Game Changing Capability

Qioptiq has a rich history in the design, development and deployment of Dismounted Warfighter Visual Augmentation System (VAS) solutions covering Night Vision, Thermal and more recently, Fused technologies.

In all cases, working closely with Government R&D communities, and operators during the New Product Introduction (NPI) process ensures that an appropriate trade of SWaP-C (Size, Weight and Power v's Cost) can be carried out. Focusing on the Operator "Touch Points" ensures product solutions are integrated well with host weapon / sight systems, along with being intuitive and easy to use, providing features and capabilities to support the User.

For Qioptiq, the MWIR HOT (Medium Wave InfraRed – High Operating Temperature) Product journey started some years back as HOT technology began to evolve. Now with the emergence and maturation of a number of MWIR-HOT Thermal Sensors from suppliers worldwide, the potential to integrate the MWIR-HOT technology into a robust, reliable and SWaP traded Weapon Sight has become a reality.

Following the conclusion of a very successful DSTL Technology Demonstration Programme (TDP) looking at the potential for HOT Technology to be ruggedized sufficiently for use on Sniper Weapons, the Qioptiq team

started with our core product line of Clip-On Sights, with **PHOENIX-S** providing the long range observation and engagement capability - well aligned to the range capabilities of modern 0.338" and 0.5" Sniper Rifles and Ammunition, whilst still being sufficiently compact and lightweight to be utilised on 7.62 Sharpshooter / Support Weapon platforms.

The main challenge with **PHOENIX-S** was to engineer a solution that would prove robust and reliable when used with 0.338" and 0.5" Semi-Automatic and Bolt Action Weapons, along with ensuring boresight retention, and the ability to adapt the system for Extended Range Engagements (ERE) out past 2km. Extensive development work analysing high speed shock data captured from a range of weapon systems, coupled with proprietary shock analysis and modelling capability has resulted in a mechanical design construction that significantly reduces the amount of weapon shock that is transferred directly to the **PHOENIX-S** Thermal Core, Optics and Electronics. This in turn ensures that boresight retention is achieved, and overall system MTBF is improved over similar products using Cooled MWIR cores. The ERE capability

continued to develop the technology, and in particular the integration into the high shock environment of Sniper Weapons, to a point where it was time for PHOENIX to rise.

We are excited to be launching the PHOENIX Products this year. PHOENIX, is a suite of Dismounted VAS products that will provide the Warfighter with enhanced Observation, Target Location and Target Engagement capabilities, based upon a common thermal core and operating architecture, enhanced connectivity and capability growth potential.

PHOENIX-S is our first MWIR HOT product, and we have

is achieved by compensating the sight orientation via a simplistic control.

Another challenge was to provide the User with a good balance of Field of View v's Range Performance, and we settled on an optical solution that provides the Operator with 4 degrees Horizontal Field of View, therefore retaining a good level of Situational Awareness, even at longer ranges.

The PHOENIX NPI team spent a considerable amount of time looking at trade studies, design options and prototypes in order to get the launch variant optimised to make an impact and produce something the User will find easy to use.

We have learned a lot about image processing and image manipulation from our recent SAKER and TALON Fused weapon sight product developments, and we have applied that learning experience to the PHOENIX systems. This provides the Operators with enhanced imaging features, including the subtle use of colour which further assists the Detection, Recognition and Identification of targets at extended ranges.

PHOENIX-S made its debut outing at the recent SOFIC Event in Tampa earlier this month where it attracted significant attention, and it will be a centrepiece exhibit at Defence Trade shows throughout the rest of the year, including DSEi in London (September), and AUSA in Washington DC (October).

PHOENIX-H sees the launch of a hand held target locator utilising common elements with **PHOENIX-S**, with the additional of additional capabilities in order to deliver a next generation Target Location Capability for Dismounted Operators such as Sniper Pairs, Mortar Fire Controllers and Forward Air Controllers.

PHOENIX-H shares the HOT Thermal Core and central processing with PHOENIX-S for commonality, but also features a digital day channel, Laser Range Finder, Laser Pointer, GPS and an advanced AHRS (Attitude and Reference Heading System) which provides accurate own and target location.

The thermal channel of **PHOENIX-H** is a true optical zoom providing the Operator with Field of View options from 16 degrees in Wide Field of View, to 2 degrees in Narrow Field of View, which results in man sized target detection at ranges in excess of 6km and vehicle sized target detection at ranges in excess of 11km. The digital optical channel is matched to the thermal channel, which provides fused imaging capability for enhanced target interrogation.

One of the main focus areas for the development of **PHOENIX-H** has been the AHRS module, and the development of the core module to provide reliable and repeatable data in the harsh military environments, a combination of sensor technology development and algorithms have helped to achieve this.

Connectivity is a theme that flows through the PHOENIX system concept, with the ability to share images, target information and other battlefield data between PHOENIX systems being seen as a key differentiator over existing / similar "Stand Alone" VAS products.

Collaborative Target Handoff (CTH) is a capability that will be embedded within all PHOENIX product variants. CTH provides the PHOENIX operators to share or "hand off" targeting location data between systems using a combination of image processing algorithms and Augmented Reality (AR) in order to position target locations and other critical battlefield information within the operators field of view. All achieved by intuitive MMI without the need for verbal or radio communications,

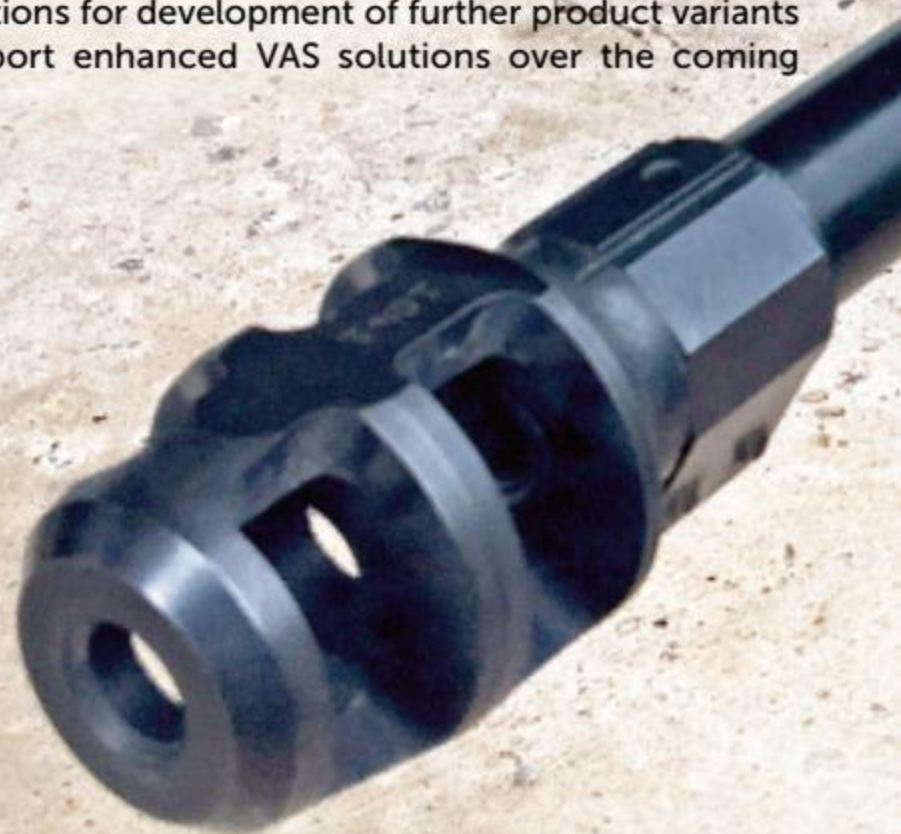
which is seen as a significant means of streamlining target identification & handoff, and therefore increasing operational tempo.

Connectivity with Battlefield Management Systems such as the Android Tactical Assault Kit (ATAK) means that PHOENIX systems can become an effective sensor node in the connected battlespace, and offer far greater utility than stand-alone systems. The potential to integrate / Interface with UAS / UGS offers great potential, along with sufficient architecture / processing headroom to incorporate auto target detection / identification / tracking capabilities.

Alongside the numerous developments focussed on enhancing PHOENIX products from the Operator / Operational perspective, the NPI team has also embraced a range of new materials and manufacturing processes, including additive manufacturing, in order to deliver lightweight & robust solutions offering excellent EMC screening, coupled with a simplistic maintenance and repair philosophy aimed at reducing system down time.

PHOENIX-H is currently in final prototype testing and will be making its debut appearance at DSEi in London (September) and AUSA in Washington DC (October) where it will join its partner PHOENIX-S on the Qioptiq / Excelitas stand.

The PHOENIX "System" approach provides the foundations for development of further product variants to support enhanced VAS solutions over the coming



years, as a number of customers worldwide seek to modernise enhance their Vision Solutions. Greater range performance and enhanced connectivity are achieved by taking advantage of the rapidly developing areas of sensor development, algorithm development and artificial intelligence to provide truly connected VAS capability, and Hyper Enabled Operators with the ability out think, out smart, and out fight our enemies. As with all of Qioptiq's products, PHOENIX systems are ITAR free solutions, whilst utilising the latest in sensor and display technologies, and without compromising performance.



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A man in a tactical uniform is walking. He is wearing a dark, long-sleeved button-down shirt with a badge on the left chest and a tactical belt with various pouches and a holster. He is carrying a large, tan-colored tactical bag in his left hand. The background is slightly blurred, showing an outdoor setting with a building and a vehicle.

MEN'S V2 SHIRT TACTICAL
LONG SLEEVE SHIRT
£59.95

MEN'S V2 TACTICAL PANT
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Mobility for Commercial Armoured Vehicles



There was a time when Commercial Armoured Vehicles (CAV) such as the Toyota LandCruiser, Nissan Patrol and Mercedes G-Wagen needed protection only against guns.

B6-armoured vehicles quickly became the standard in a rapidly developing industry. The wars in Iraq and Afghanistan presented a new threat with the Improvised Explosive Device (IED) and called for new types of vehicles: the Mine Resistant and Ambush Protected vehicle and Armoured Personnel Carrier (MRAP and APC). Protection against IEDs also inspired the development of the V-hull, which deflects an IED blast up and sideways. However, MRAPs and APCs are not suitable for all types of mission. That is why it is not

uncommon for CAVs these days to be built to military standard, such as VR9, VR10 and even STANAG 4569 level 2. The vehicles are designed to protect the occupants against blast, severe firepower and sometimes even CBRN(E) threats. In such cases, weight becomes a serious issue. After having been armoured, a soft skin can almost triple in weight. OEM-components such as the rims and brakes are no longer strong enough and should really be replaced by high-quality heavy-duty upgrades which are specifically designed for



the vehicle's new purpose.

This is why TSS International BV, an ISO-9001 certified Dutch family business just south of Rotterdam in The Netherlands, has made it its mission to make sure (Commercial) Armoured Vehicles can keep moving under the most difficult of circumstances. TSS Heavy Duty Runflat Wheels, Rodgard™ (FINABEL-compliant) Runflat inserts, MOV'IT Security™ Brakes, TSS ProtecTank® self-sealing fuel tanks, B&G Vehicle Intercoms and SKYDEX Technologies shock mitigation products are all part of a carefully selected portfolio, designed and tested to internationally recognised standards. Keep reading for a brief line-up.

Installing MOV'IT Security™ Brake upgrades, means you are increasing the friction between the pads and discs; optimising ventilation; strengthening the brake calipers and reinforcing the brake lines. As the weight distribution of the vehicle has changed, this has also been incorporated into the design of the brakes.

TSS was the first on the market with serial production of tested and certified high-payload alloy rims. Starting with 1500kgs capacity, constant developments have enabled 2000kgs payload per rim, which can be delivered fully assembled and ready to mount on the vehicle. TSS Heavy Duty Wheels are available for most CAV platforms and are always delivered with Rodgard™ Runflats, suitable for the high payloads.

TSS ProtecTank® is the truly self-sealing fuel tank protection system, allowing for significant weight savings in the armouring process. No vehicle modifications are necessary: the production makes use of the OEM fuel tank, which is tailor-made to fit as intended by the OEM.

B&G Vehicle Intercoms allow for closed-door, 2-way communication with bystanders of your armoured vehicle. Versions for communication between vehicle compartments and Public Address systems are available as well as configurable sirens and red-blue LED lights for in the grill.

The latest addition to TSS International's product line-up is intended to enhance the mobility of the occupants

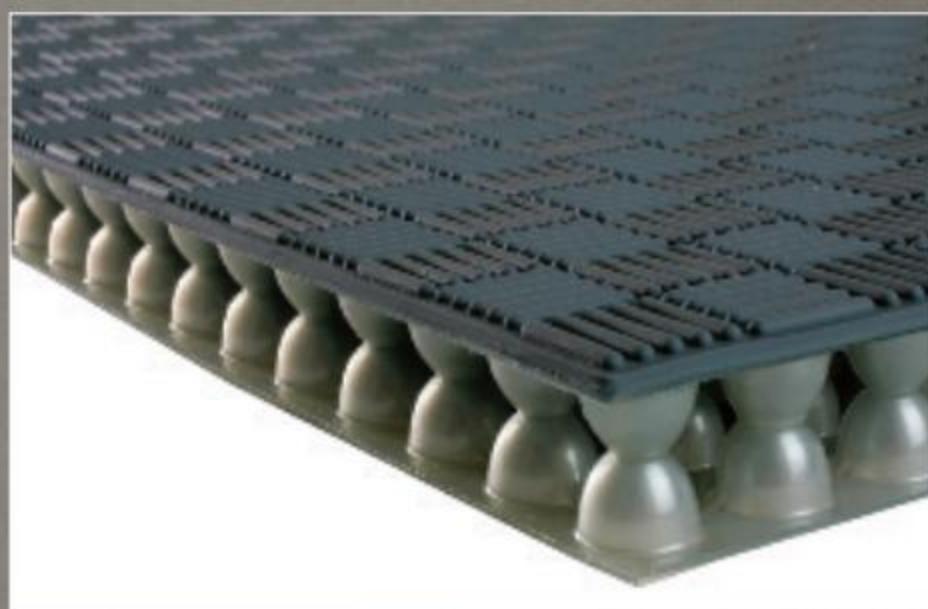


of an AV. Due to the geometry with a flat underbelly, most CAV's transfer a lot of kinetic energy of an under-vehicle IED blast upwards, potentially crushing any feet resting on the floor. Placing SKYDEX Convoy Deck on the floor can significantly limit the negative consequences of an under-vehicle blast. These shock mitigation mats are easily retro-fittable, but can also help reduce the weight of the vehicle if integrated in the design of the vehicle, possibly eliminating the need for an elevated floor. With new versions of the Toyota LandCruiser and Mercedes G-wagen becoming the new standard, it is a good time to think about raising the bar for personnel protection on these vehicles.

TSS International products are tested and certified by institutes such as TNO, Beschussamt, IABG, TÜV, MBDA, RDW and KIWA. TSS is a registered UNGM and NAMSA supplier and member of NIDV, ESTA and Fleet Forum. A number of TSS' products have been allocated NATO Stock Numbers.

To find out more about Armour Mobility, visit www.TSSH.com

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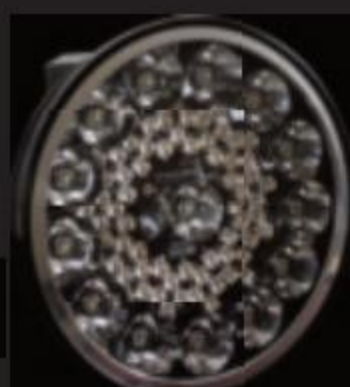
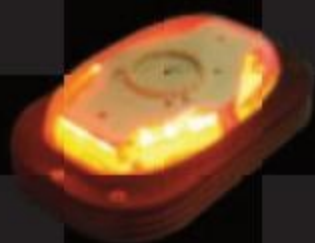
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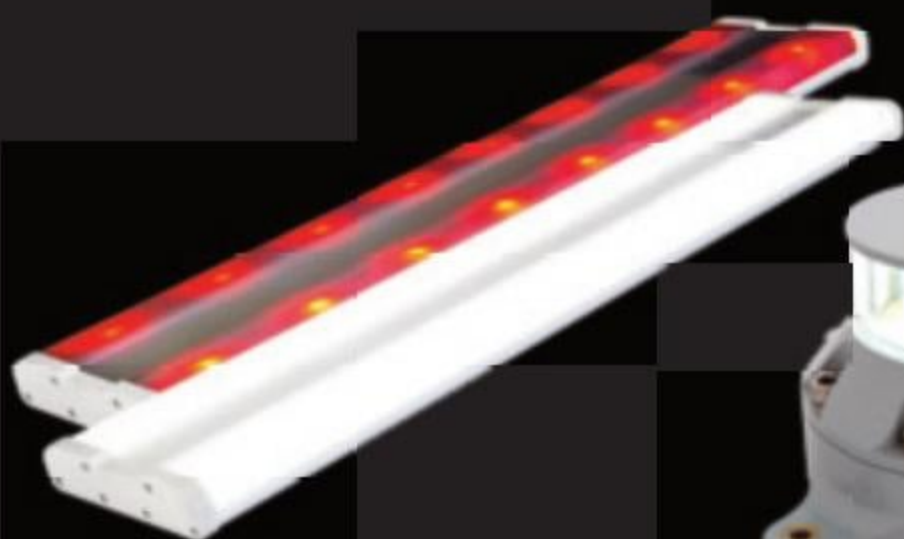
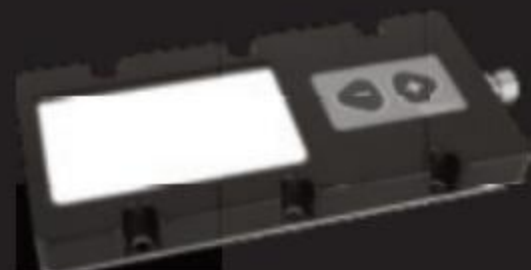
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THIELMANN WEW expands market capabilities

THIELMANN WEW is looking forward to meeting with customers at DSEI 2019 in London, UK, to talk through the expansion of its defense fuel and water capabilities to meet the evolving needs of armed forces around the globe.

The company has undergone significant transformation since its acquisition by THIELMANN in 2016.

With a deep investment program underpinned by a strategic road map and a cross pollination of tank container expertise, the site at Weitefeld, Germany has been upgraded and modernized to provide the design and engineering required to support the dedicated defense team who are ready to lead the company's defense and expeditionary force activities into the next decade.

Falko Pfeuffer, Head of Defense, THIELMANN WEW, said:



"We have been completely re-energized by the investment by THIELMANN in both resource and knowledge, and our growing and healthy order books shows the results of that investment one hundred percent."

As one of the world's leading container companies, THIELMANN knows a thing or two about engineering and manufacturing excellence. Under the guidance of its highly experienced management team, the THIELMANN WEW business line has the support it needs to continue succeeding as it looks to tomorrow, while retaining the engineering excellence, expertise and understanding of the defense industry that it has been known for more than two decades.

The support of THIELMANN has given WEW an improved capacity to look ahead, to analyze how its customers want to evolve their fuel and water logistics solutions, and be one step ahead in putting the pieces of the logistics puzzle together so they can get on with the job at hand.

"We lead the market with our stand-alone, drop and go fuel and water tanks, but now we are looking to expand our capabilities with new forays into whole camp life support," Pfeuffer said. ***"We have put together a new range of options that take care of all camp fuel and water infrastructure, and we are keen to talk to our customers at DSEI about how we can help them take their fuel and water logistics requirements into the next decade."***

The industry-renowned WEW fuel and water tank container solutions deployed by military forces worldwide

remain highly in demand, as part of THIELMANN there is more space for the business line to support its customers as they look to overcome the emerging challenges of logistic support facilities required in modern warfare and defense roles.

"Our tried and trusted solutions in use with US and European customers worldwide - HIPPO, Camel and deployable fuel and water storage and distribution containers to name but a few – can be tailored to meet customer requirements, no matter where they are deploying around the globe," Pfeuffer said. ***"But as new needs emerge, extending the containerization of both supply and bases, to smaller compact and flexible systems for both special forces operations and the last tactical mile; here we are innovating."***

"This is the value proposition THIELMANN WEW offer our customers – whether our customers need engineered modular flexible and agile solutions for fast tempo operations or integrated base camp infrastructure that provides all fuel, potable water storage and provision, and waste water removal or treatment capabilities ready to go, anywhere in the world; here is where we stand out."

THIELMANN WEW remains dedicated to putting the end user at the centre of its planning, design and engineering process. As it heads into 2020 and the opportunities that may bring, its customers can remain sure that whatever the mission, whatever the location, whatever the demands; THIELMANN WEW makes it possible.





DEFENSE AND EXPEDITIONARY TANK CONTAINER SOLUTIONS

Low-risk and flexible, our 'drop and go' deployable fuel and water tank solutions are designed to support your troops and equipment wherever they deploy around the globe.

From semi-permanent base camp infrastructure with fuel, potable water and waste water removal capabilities, to agile solutions for the last tactical mile, our industry-leading and modular tank container solutions have been keeping defense and expeditionary operations fuelled and watered for more than two decades.

Whatever the task, whatever the location, THIELMANN WEW makes your mission possible.

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Designed for point of injury treatment in demanding environments, the ROG is an unpressurised and non-explosive oxygen supply that requires no electricity, mixing or filling. FDA 510K cleared, the ROG delivers oxygen when you need it, where you need it:

- **DURATION: 15 MINUTES**
- **FLOW RATE: 6 LITRES PER MINUTE**
- **OXYGEN PURITY: 99.5 %**



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THE BLAST GAUGE[®] SYSTEM



BLAST EXPOSURE.... EXPOSED

PRESSURE THRESHOLDS: WHAT YOUR MEDIC NEEDS TO KNOW

Numerous studies point out the dangers of overpressure in very real terms

The United States Department of Defense has reported more than 250,000 Service members have suffered from a traumatic brain injury (TBI) between the years 2000 and 2012.¹ For this reason, it's not surprising that TBI has become synonymous with the term "signature injury of modern war."

The main culprit of injury in blast TBI is peak overpressure caused by shockwaves from an explosion. The shockwave is undetectable to the human-eye, but can create lasting damage to the brain and body.



Soldiers and Tactical Officers are often exposed to harmful levels of peak overpressure both in training and in the field. To counteract this threat, measuring an individual's exposure level is key.

Overpressure from an explosive event is measured in pounds per square inch (psi), and like any form of measurement, understanding what this metric means is key. So what are the thresholds for bodily exposure to overpressure?

When talking about minimum safe distance, it's common to hear law enforcement agencies and military operators cite 4 psi as a "safe" baseline threshold. This is consistent with the assumptions underlying the safe standoff curves currently used by most military and law enforcement breachers. However, research indicates this may be an oversimplification, as multiple low level exposures can still be damaging. In addition to the damaging effects of a single event, recent and ongoing studies of repeated blast exposures have revealed that there is a cumulative effect associated with chronic low-level blast (LLB) exposures. These findings indicate that—like concussive TBI injuries common in contact sports— even small, cumulative exposures can be damaging.



Furthermore, factors other than frequency of exposure can contribute to injury severity. Variability of factors such as blast duration, reflections, bodily condition, and dehydration² can greatly affect degree of injury. For all these reasons, measuring exposure level provides critical information to the health care provider aiding in triage and treatment of this complex injury.

This leads us to the original question: what are the thresholds for bodily exposure to blast overpressure? Simply put, a single exposure of 0 – 4 psi is typically safe, though it's critical to seek medical attention if you're not feeling well with symptoms such as headaches or nausea. This is because it only takes 3 blast exposures at 3 psi to cause gastrointestinal and pulmonary injury.³ 5 psi is enough to rupture an eardrum, and as exposure levels climb further towards a peak overpressure of 16, the likelihood of injury grows.⁴

Two recent studies have shed new light on the neurological impacts of blast overpressure exposure: the Quantico Breacher Injury Study (QBIS) and the Preventing Violent Explosive Neurological Trauma (PREVENT) study. The QBIS study found that a single blast overpressure exposure of 13 psi showed no changes in neurobehavioral testing or imaging of the brain.

However, the PREVENT study using non-human primates identified neurological changes post-mortem



as low as 12 psi in the absence of any symptoms.⁵ Additionally, the PREVENT study using swine found biomarkers for brain injury and inflammation for blast overpressure exposures above 24 psi.⁶ As the peak overpressure increases, the effects are more devastating: 30-40 psi is the threshold for lung injury and at 100 psi there is possibility of death.⁷

As mentioned earlier, it is not uncommon for a Soldier or Tactical Officer to be subjected to multiple blast events while performing his or her job. Multiple studies, including one recently published in the Journal of Neurotrauma,⁸ suggest that LLB causes a measurable degree of brain agitation known to cause cognitive impairment and depression. In order to protect our heroes, we need to be able to detect, record, and monitor repeated exposures.

This is where the Blast Gauge® System comes in. Weighing less than an ounce, the Blast Gauge is a powerful, easy-to-use overpressure sensor that automatically records an operator's exposure to an explosive event. With the push of a button, the gauge emits a discreet visual cue with green, yellow and red status LEDs providing instant feedback on overpressure exposure.

The system's ability to capture and record detailed signatures from events provides invaluable information that can be downloaded via a micro-USB connection and used by medical personnel to aid in the triage and treatment of TBI. In-depth reports can be used to track cumulative exposure and create a permanent health record for correlation to long-term effects. Exposure can be measured and recorded in both training and combat scenarios such as from improvised explosive devices (IEDs), shoulder fired weapons, and artillery live fire training.

The life-preserving aspects of the Blast Gauge System are recognized by military and law enforcement communities across the world. Militaries, Bomb Squads, SWAT Teams, and other Tactical Officers are often exposed to overpressure from explosive breaching, flashbangs and IEDs, thus the need for adopting an advanced sensor that can measure exposure levels.

You may be wondering what more can be done to protect your operators from this threat. Knowledge of overpressure exposure is essential and can be achieved by wearing advanced overpressure sensors in both training and operations. Without them, you have no way of knowing the magnitude of blasts and could be guessing at the extent of possible injury.

THE BLAST GAUGE SYSTEM[®]

General information:

The Blast Gauge System is a set of three wearable overpressure sensors for the head, shoulder, and chest that captures the wearer's blast exposure. The system software tracks each user's exposure data to guide triage, improve tactics, monitor safe training habits, and trace blast overpressure exposure to symptoms.

Physical characteristics:

- Reliable one-year battery: geared to last for a typical 12-month deployment
- Tool-free mounting: attaches to gear, helmets, structures, or vehicles
- Battle-tested: currently fielded by US military
- Durable: MIL-STD-810G compliant design withstands weather and blast

System Features:

- High memory capacity
- Real-time LED blast indicator
- Wireless data transfer
- PC software application for in-depth data analysis

User-friendly mobile app:

- Can be used with any android-based tablet
- Wireless scanning can receive multiple systems at once
- "Quick-scan" and "full-scan" features for efficient post-blast triage
- Exportable log files for medical records



HEAD
SHOULDER
CHEST



CSI

BLACK BOX
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POLYAMP



Now serving new and existing clients in the US market

The Polyamp businesses

Polyamp has two main sector of operations:

- Signature Management Systems, Systems Division
- Industrial grade DC/DC Converters and Power supplies

Signature Management Systems, Systems Division

The Systems Division of Polyamp AB specializes in the design, manufacture and supply of Signature Management and Control Systems for Worldwide applications within the International Naval Industry.



Polyamp supplies Military Systems such as:

- Degaussing Systems.
- Influence Mine Sweep Supply Systems; MSS2000.
- Range Software; SWECADE.



- UEP/ELFE Measurement Systems
- Exercise Mine Systems; POEMS.
- Underwater Multi Influence Sensor Systems; UMISS

Customers include Shipyards, Navies, Governments and Prime Contractors from the International Naval Community.

Systems Deliveries and Experience

The Company's experience in Degaussing is considerable with over more than 25 years that covers the design and supply of Digital Degaussing equipments for submarines, steel surface ships and mine countermeasure vessels (MCMVs). All Polyamp AB Degaussing systems are fully digitalized, with multiple magnetometer control, and all are of the Advanced type (ADG) and using the latest type of modern hard/software open oriented. Latest design are of the modern decentralized type.

They include:

- RSwN MCMVs type Landsort and Styrsö class; (11 ships)
- RSwN Gotland Class Submarines; (3 submarines)
- Range Software; SWECADE.
- RSwN Corvettes type Stockholm, Göteborg classes & the Visby Class Stealth Corvettes; (11 ships)
- Singapore Navy Bedok Class Minehunters & Challenger Class Submarines; (8 vessels)
- US Navy San Antonio Class Landing Platform Docks; (11 ships)
- US Navy CVN 77 Air Craft Carrier; (1 Carrier)
- Royal Danish Navy Absalon Class Flexible Support Ships and Nils Juel class Frigates; (5 ships)
- Royal Danish Navy SF MKI MCMV vessels; (2 vessels)

Other Systems delivered are:

- Multi Influence Sensor Systems for France; DCNS & DGA, (2 systems)
- Several UEP/ELFE sensor systems for RSwN, US, India, Germany and other International Navies



Industrial grade DC/DC Converters and Power supplies

Polyamp has designed, manufactured and marketed industrial grade switched mode DC/DC converters since 1970 with power ratings from 30 to 2000 W. There are more than 350 standard types in the Company's current product range and some of them are kept in stock for higher service degree.

Polyamp's DC/DC converters are used in many applications where the customers demand high reliability and accuracy performance throughout their whole life. Particularly when operating in very harsh electrical/physical environments. All Polyamp units are designed for easy installation and do not need any additional electrical or EMC protection when integrated into customer applications.

During this time Polyamp has successfully delivered and supported



DC/DC converters in a wide range of applications, and in so doing has established a reputation for quality, reliability and on time deliveries.

Polyamp supplies switched mode power supply systems with high reliability and dependable performance in harsh electrical and physical environments.

Product range covers:

- DC/DC converters 30 to 2 kW
- Inputs from 10 up to 850 Vd.c.
- Outputs from 5 to 150 Vd.c.
- AC/DC Power Supplies 1 - 15 kW where we also sell Delta Elektronika and Efone Powernet products.

Customers include railways, electric vehicles, the armed forces, air traffic control and the process and power industries including nuclear.

Applications include:

- Train and Track Side
- Process Control, safety systems
- Power Plants (including Nuclear safety locations)
- Power / DC Distribution & Telecom
- Forklifts, Electrical Vehicles
- Radio applications
- Industry
- Naval and Military
- Air Traffic Control

CONTACT:

Nick Avelin | President

Polyamp Inc
1209 Orange Street
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Aerospace and Defense Optics for Mission-Critical Applications



In harsh aerospace and defense environments there are no second chances.

Mission-critical technology demands uncompromising precision, absolute reliability, and close partnerships with suppliers. For more than seven decades, G&H has delivered proven optical solutions for aerospace, avionics, and defense platforms, including ruggedized commercial photonic components, build-to-print-products, and full-scale development of customized solutions.

We are recognized for the breadth of our acousto-optic, electro-optic, crystal-optic, fiber optic, and precision optic products. Commercial off-the-shelf (COTS) components, however, represent only part of G&H's capabilities. Our engineers bring decades of experience working closely with program managers at prime aerospace and defense suppliers. We are able to take on projects at any stage of development and apply rigorous

contract discipline and life-cycle management practices to help ensure optimal earned value for your program.

Our leadership in supporting mission-critical applications with high-performance optical components, modules, and subassemblies has established G&H as a preferred supplier for leading aerospace and defense contractors around the globe. Our technology and expertise in optical design and manufacture have helped advance programs and missions in several key application areas.

A World Leader in Aerospace and Defense Optics

Imaging Optics

Unmanned aerial vehicles (UAVs) and other airborne platforms gather more image data more quickly during ever-longer flight times. G&H's precision optical components and advanced lens assemblies enable optimal FOV and resolution for short, mid and longwave



infrared imagers, making them critical elements in aerospace and defense platforms used for intelligence, surveillance, and reconnaissance (ISR) missions. Our SWIR lens assemblies are also used in monitoring directed energy weapons performance.

Photonic Components for Directed Energy

The speed and precision that photonics technology enables is instrumental for the directed energy weapons (DEW) applied to missile defense. With decades of close collaboration with prime defense contractors and avionics manufacturers, G&H brings the exacting design and manufacturing expertise required for the fiber optics, electric-optic modulators, and sights and windows that help ensure DEW platforms perform reliably.

Target Designation and Rangefinder Optics

Target designation and rangefinding tasks necessitate uncompromising accuracy and reliability under the most demanding conditions, whether they involve an integrated warfighter operating in the fog of battle or a missile targeting system with milliseconds to lock onto a target. The optical coatings and opto-mechanical lens assemblies produced by G&H not only ensure consistently reliable performance for these aerospace and defense systems but can also help reduce size, weight, and power demands to support greater portability and wider deployment.

Optics-Based Gyroscopes for Navigation

G&H is a leading designer and manufacturer of precision optical components, pump lasers, and fiber-optic couplers for inertial navigation systems used in avionics and defense. Whether the application calls for a ring laser gyroscope for airborne or maritime navigation or a fiber-optic gyro to guide the flight of a missile or UAV, G&H offers proven expertise in the development of both legacy and emerging inertial platforms.

Space Photonics

Space-based platforms must deliver uncompromised signal transmission and reliability in supremely harsh environments. Space-qualified optical components, lens assemblies, and subsystems from G&H deliver consistently excellent connectivity and bandwidth for intrasatellite and satellite-to-ground communications. Our expertise in fiber optics and photonic signal processing is also increasingly leveraged to enhance the sensing capabilities for systems monitoring earth and space environmental conditions. G&H is at the forefront of developing lower SWAP-C photonics modules for this emerging market.



Infrared Countermeasures

As anti-missile countermeasures shift from expendable solutions toward on-demand, near-unlimited infrared emitters, defense contractors are exploring innovative fiber-optic and lens assembly solutions from G&H. Our photonic components also enable new airborne and marine systems that offer stronger defenses in electronic warfare scenarios while delivering lower weight, higher bandwidth, and improved detection capabilities.

Periscopes and Sighting Systems

A trusted provider of periscopes and sighting systems, G&H continues to enhance the intelligence gathering and situational awareness of armored fighting vehicles. In addition, our innovations in shortwave infrared and advanced optical coatings are driving the development of cutting-edge sighting solutions for airborne platforms and lidar systems.

Your Source for Mission-Critical Aerospace and Defense Optics

High mix and high value: As a leading program partner for prime contractors and a global supplier of proven optical solutions for aerospace, avionics, and defense, G&H can help ensure your mission-critical systems perform reliably and to expectations. To learn more about our aerospace and defense optics, contact us [here](#).

About G&H

G&H is a photonics technology business headquartered in Ilminster Somerset, UK with operations in the UK, US and Asia. A world leader in its field, the company researches, designs, engineers, and manufactures advanced photonic systems, components and instrumentation.



When optimal performance is critical – whatever the domain and environment

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Over seventy years of designing and manufacturing ruggedized optical subsystems and components for mission-critical applications

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Advanced hearing protection, Natural communication

The new ComTac™ VI NIB Headset helps protect your hearing, improve situational awareness and communications in noisy environments.

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PARAMOUNT PANELS

Instrument Lighting & Control Panels



Paramount panels will once again be participating at this year's Defence & Security Equipment International, **DSEI 2019**.

We will be exhibiting from Tuesday 12th through to Friday 15th September inclusive at the ExCel London, and we would welcome you to visit us at our booth located in the South hall, at **S2-301**.

Paramount Panels will be showing an extensive range of products including NVIS LED control panels, Instrument and internal aircraft/vehicle lighting along with transilluminated control knobs.

At this year's event we will be launching our latest custom designed PWM Solid state dimmers, which is designed primarily for the dimming control of lighting sources within an aircraft cockpit, which is fully qualified to D0-160. Other benefits of our dimmer include the ability to control mixed lighting technology (LED & Incandescent) from one device, which is often the case in aircraft NVG lighting upgrades.

When visiting us at our stand, you will have the opportunity to discuss and view all of our products, and please do not hesitate in contacting us prior to arrange a specific meeting at your convenience.

www.paramount-panels.co.uk

www.paramountpanels.com

Paramount Panels (UK)

Mollison House | Aden Road | Enfield | Middlesex | EN3 7SY | United Kingdom

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PARAMOUNT PANELS

HESCO GROUP LAUNCH CAMP SOLUTIONS

Hesco, the creators of the renowned military barrier are introducing their full camp solutions for the first time in the UK, at DSEI 2019.

HESCO® representatives will be at stand N9-160, where customers will be introduced to a range of new products and services, including, turnkey Camp Solutions.

Mike Pickup, Technical Director for Hesco and former Royal Engineer has established expertise in force protection.

“When working in hostile, isolated parts of the world, it’s essential your solutions provider can support your developments, seamlessly integrate into your plans and supply flexible frameworks for individual defence requirements.”

Having spearheaded the project, he is excited to roll out the Hesco camp model.

“We are now able to design, contract and tailor services, considering the physical, and cultural needs of the end-user, and be the total solutions provider for remote operating bases and camps.”

With decades of experience in supplying perimeter protection, accommodation bunkers, ammunition stores and onsite training for the construction of Forward Operating Bases, this new development for Hesco is a natural advancement for their expanding portfolio. They operate as part of the PRÆSIDIAD group, alongside total perimeter security solutions provider Guardiar, and soon to be acquired DREHTAINER, innovators of containerised protective structures.

“With our experience, our partnerships and networks, we will meet the customers’ requirements with the most consistent, tried and tested methods” Says Mike.

“We’re able to supply a complete fully-kitted site for humanitarian, military and field personnel to sleep, work and live soundly behind a name they know and trust.”

The teams will be available throughout DSEI at stand N9-160 to discuss new developments, visit hesco.com to arrange an appointment.

STOP EVERYTHING.™
hesco.com

A large military truck is shown in the process of deploying a long, continuous line of HESCO MIL units. The units are being unrolled from the back of the truck onto a gravel surface. The background is a hazy, overcast sky.

RAIDTM

**"...rapidly deploy over
1,000 feet of HESCO
MIL units in under
five minutes."**

HESCO RAID, the patented containerised barrier system, makes it possible to rapidly deploy over 1,000 feet of HESCO MIL units in under five minutes. Halving logistics and saving on precious and costly time, giving immediate cover from sight.

The Hesco barrier is engineered with protection as paramount. Deployed in the most hostile environments, MIL units are symbols of safety in modern warfare. Over decades of use around the world, militaries have centered their strategic planning around this essential equipment. The barrier has shaped the forward operating bases, front lines and even landscapes of warzones on an immense scale. They inevitably factor into the considerable logistical burden of deployment into a warzone. The more Hesco units, the more fuel required to transport them. The more vehicles, the more possible targets. More vulnerable still, are the personnel on the ground, physically deploying units. All potential casualties, that the barrier could not save. So what happens when protection is paramount, but no longer means simply how much blast can be stopped?

Hesco RAID is the result of 15 years of design and engineering, to reinvent a significant life-saving product used by the military, to save even more. Halving transportation requirements, minimizing the manpower needed to successfully deploy, and providing cover at a speed never seen before. RAID raises personnel protection to a new level, facing the evolving changes of overseas conflict, border security, and perimeter protection, head-on.

Make an appointment with the team at DSEI 2019 to discuss their latest innovations and bespoke consultation process, which includes design and training, ensuring you receive the best in asset protection. You will also be able to see first-hand Hesco protective products, RAID deployment system and Defensive Barrier model.

RAID 7 now with NSN: 5450-99-821-3761

support@hesco.com
Stand: N9-160

RUD OPTILASH -CLICK

Offers Flexibility in
Lashing Procedures



Can be installed in bore holes and guides of the vehicle frame:

Working across industries where safety and quality is essential RUD deliver on ground-breaking Lifting and Lashing products, and have earned over 500 international patents for their continuous product development and innovative approach.

RUD Chains new OPTILASH-CLICK lashing point with spring loaded pin offers a greater degree of flexibility in lashing procedures. Firstly it can be installed in bore holes and guides of the vehicle frame, making it easy to install and allowing retrofitting from the outside without tools. Installation is possible after painting or galvanising the vehicle frame.

The OPTILASH-CLICK supplies a lashing capacity of 10000 daN and a safety factor of 2:1. It is 100% crack inspected and corrosion protected.

The special offset shape of the OPTILASH-CLICK ensures that flat lashing angles are possible. It can be pulled out of the guiding retainer and used when the load is upright and oversized. Loading can be done from any side due to the optimal lateral guiding and supporting surfaces.

RUD Lashing equipment helps ensure maximum safety when lashing and transporting heavy loads. They are typically used across a range of sectors from lashing for the defence and aerospace sector to heavy and abnormal loads for road haulage, load beds, cargo, offshore, rail, construction and plant to name a few.



Tradition in Dynamic Innovation

RUD OPTILASH LASHING POINTS

- ✓ OPTILASH - FIX / CLICK variations
- ✓ Lashing capacity 10000 daN & safety 2:1
- ✓ 100% crack inspected & corrosion protected
- ✓ Flat lashing angles possible
- ✓ Used in bore holes & guides of vehicle frame
- ✓ Can be loaded from any side
- ✓ Easy installation & retrofitting from the outside without tools



RUD
Tradition in Dynamic Innovation

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EXSEL
GROUP

EXSEL GROUP

The Exsel group is a leading independent defence technology solutions company. We provide integrated blast and ballistic engineering solutions, electronic and mechanical systems and support services to Defence and Industry where protection, reliability and safety are paramount.

Our core products cover ECM, secure data handling, specialist containers, vehicle engineering and innovative power distribution solutions – all designed and deployed in the world's most extreme, hostile and remote environments.

- **Specialist containers**
- **Integrating complex mechanical, electrical and software systems**
- **High-fidelity, robust training systems**
- **Lightweight, modular armour solutions**
- **Vehicle engineering**

EXSEL DESIGN & INTEGRATION



Across Air, Land and Sea Exsel Design & Integration products and services have proven their high quality with years of continuous service. Our precision engineering capability includes the innovative design, build, certification and installation of electromechanical, electronic and communications systems, mobile platforms and container-based solutions for rapid deployment and severe environment applications.

Many projects are supplied on a 'turn-key' basis against initial concepts or drawings.

EXSEL ELECTRONICS



Exsel Electronics designs and produces fully engineered, documented and supportable electronic defence systems to meet customers' project specific requirements with a multi-disciplinary team of systems, software and electronic engineers.

The Exsel Electronics facility is the group centre of excellence for design, manufacture and testing of software and electronic systems.

Encompassing all stages of projects from requirements capture, through design and development to manufacture, test and certification, Exsel Electronics provides customers with a low risk high quality approach to software and electronic engineering.



EXSEL FIELD SERVICES



Exsel Field Services offers rapid deployment to severe environments, on-location support and services for force and asset protection in some of the world's most hostile locations.

We ensure that product and service contracts are completed to a high quality and assist with end-user certification, product installation and on-going in life support and maintenance services.

DYNA ARMOUR



With proven capability in designing bespoke personnel protection for customers in Defence, Government and Civilian Industry, DynaArmour works closely with a number of partners to design, develop and install a variety of protection solutions; including Portable Armour Protections systems, Personal Amphibious Armour and our Maritime protected weapon station for GPMG, and Minigun deployed with the Royal Navy around the world.

enquiries@exsel-group.com

+44 (0) 1684 579000

www.exsel-group.com

EXSEL TRAINING & SIMULATION



Exsel Training & Simulation provides simulators, part task trainers and emergency egress trainers. Our hardware mirror the form and function of the subject equipment and are much more robust for continuous use in training environments. Our simulators facilitate training in high fidelity, representative and realistic environments across Fixed & Rotary Wing Aircraft, Wheeled & Tracked Vehicles & Marine applications. Recent examples have included fuselage trainers, fast jet maintenance training devices, troop trainers and emergency exit procedure systems.



EXSEL GROUP

BRITISH-AUSTRALIAN COLLABORATION

British Cannon | Australian Fire Control System and Fully Stabilised Remote Weapon System



Pictured: EOS R400S Mk2 D-HD-4X Remote Weapon System with 30mm Cannon / 7.62mm Coax / Javelin Anti-tank Guided Missile

The EOS R400S is the selected remote weapon system for the Australian Boxer, to be used as part of the Australian Defence Force Land 400 Phase 2, Combat Reconnaissance Vehicle Capability Project.

Multiple configuration options including:

- Dual weapon
- Anti-tank guided missiles
- Ground to air missiles
- Counter UAS soft and hard kill effectors
- All 30x113mm lightweight cannons, Northrop Grumman Chain Gun, DEFA and Aden; including the British Venom 2 cannon from AEI Systems

FOR TOTAL BATTLESPACE CONNECTIVITY PEI-GENESIS HAS A SOLUTION



PEI assembles and can support the most widely used Mil-Spec connectors such as MIL-DTL-38999, MIL-DTL-5015, D-Sub, Micro-D Connectors, and more, available in standard or custom configurations. Whether your designing in or sourcing parts for military aviation, tanks and ground vehicles, UAVs, body-worn equipment, or ships, we have what you need.

Visit us online at, www.peigenesis.com, or call your local sales office to discover our full selection of Mil-Spec military connectors in stock and ready to ship in 48 hours.

KEY PRODUCTS:



Rhino



Terrapin / SCE2



38999 Reduced flange



2M



Reduced flange USB3



Marshall Aerospace and Defence Group

Dispatches first deployable containers
for Netherlands Army



The first Container Systems ready to leave on their way to the Netherlands as part of the multi million pound DVOW contract awarded to Marshall Aerospace and Defence Group by the Dutch Defence Materiel Organisation (DMO) at the end of 2018.

The first Container Systems have left Marshall on their way to the Netherlands as part of the multi million pound DVOW contract awarded to Marshall Aerospace and Defence Group by the Dutch Defence Materiel Organisation (DMO) at the end of 2018.

The units are part of the major Dutch Defensiebrede Vervanging Operationele Wielvoertuigen programme, or DVOW, to update the Dutch Armed Forces with new vehicles, containers and support equipment. These initial warehouse units will be used to train operators in handling the containerised systems and to fulfil a training commitment for their vehicles.

"Marshall has worked hard to meet our requirements not only in terms of quality but also delivery times and fulfilling an early commitment to support our driver training programme, this gives us real confidence that they will keep to the programme over the next five years," said Programme Manager Kol ir. L.J. Jacobs.

"We are delighted to be delivering these container systems only seven months after the contract was awarded," said Alistair McPhee, Chief Executive of Marshall Aerospace and Defence Group, adding *"this is a tremendous effort by our Land Systems team demonstrating their agility to respond to customer*

requirements and their innovation in developing a rapid development and manufacturing programme for these containerised systems."

The units will be used after training for warehousing and are the first of the 1400 container systems being delivered over the next five years. These include Command and Control and Medical container systems, Workshops, controlled atmosphere and basic stores units, together with an initial 10 year fully integrated availability support package. As part of the design work Marshall is also providing a new expandable container which uses lighter materials but maintains the strength of its in-service Matrix Expandable products.

The contract comprises two main elements, the production of the various containers and a full support programme. The latter encompasses a full availability-based fleet management package, which utilises a bespoke Fleet Management System to provide assured fleet availability and performance and ensures that the units are maintained to the latest standards, together with a significant training commitment.

Marshall Aerospace Netherlands BV based in Leiden, is providing engineering and supply chain management and acting as a focus for the ongoing maintenance and support contract.

Marshall has had a presence in the Netherlands since 1995 when it provided command and control shelters. Subsequently it has supported the country's C-130 fleet, provided ambulances, flat racks, and fitted out the Boxer AFV ambulances.

For video showing the vehicles being loaded please go to <https://youtu.be/rqf1fOfmdiw>



The first containerised systems leaving Marshall on their way to the Netherlands as part of the multi million pound DVOW contract awarded to Marshall Aerospace and Defence Group by the Dutch Defence Materiel Organisation (DMO) at the end of 2018.

POWER WITH PRECISION



ISF

A variety of engines ranging from 2.8 to 6.7 litres displacement band ensures that there is always a Cummins engine to match your engineering and design team's requirements and technology to match your power needs, from unmanned vehicles to main battle tanks.

Meeting military standards, Cummins engines offer excellent fuel economy and ability to operate in harsh environments. Cummins engines provide outstanding power density, low emissions, power curve and peace of mind in harsh environments.

To learn more about Cummins visit us at **DSEI | Hall N4, Stand 260** or visit cummins.tech

WITH N.



ISBe 6-CYLINDER

QSX

V903

liters to 95 liters with no gaps in our power
Cummins engine right for your needs. Working
ms, we utilize almost 100 years of experience
and configuration needs. From small
nks, Cummins has you covered.

s engines are first class in reliability, technology,
n austere environments. These highly advanced
ensity for ultimate performance throughout the
azardous operating environments.

s at

n/defense.



ALWAYS ON

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Lutra Associates and Survival Systems(SSL) of Halifax Nova Scotia enjoy successful collaboration in UK

Over the last 4 years Lutra Associates and SSL have worked steadily to bring SSL's capability and products to the fore in the UK. SSL are a world leader in the provision of Helicopter Underwater Escape Trainers (HUET), the infrastructure that supports and enables their use and the facilities in which they are used. The whole system is colloquially known as a "Dunker".



An SSL METS being used to train pilots of the French Marine Nationale in underwater escape techniques. METS are used to train fast jet and helicopter pilots.

HUET is somewhat of a misnomer as there are versions of SSL's METS® (Modular Egress Training Simulators) also available for fast jets, light aircraft, rescue and small boats and oil platform escape systems. There a variety of cranes and lifting systems and other rescue training facilities



Edging The Gantry Crane into position at a new facility in the UK. Several different cranes capable and certified to meet the safety requirements of lifting people over and from water are uniquely available from SSL



The Yellow SSL Gantry Crane in position at a new facility in UK. This crane was ordered and delivered (from Canada) within 6 weeks because the system was available from within existing inventory

such as; Survival Training Simulation Theatre (STST) and fire training facilities available. SSL also provides cranes certified to lift people over and from water to ensure the safety of trainees: a major component of a "dunker".

The first success in this co-operation was the provision of a lifting gantry crane to move existing and obsolete HUETs in a new build training facility. Subsequently SSL and Lutra have been working together to provide systems to other major users. The wide range of capabilities backed by a very experienced and innovative design capability enables SSL to provide a complete end to end design to delivery to disposal capability which is much appreciated by potential customers.

Lutra and SSL have been able to step in and offer loan or lease equipment pending the customer organization gathering the funds and project management team to purchase new or enter a long term leasing contract. Because of SSL's presence in more than 30 countries there is a solid inventory of used equipment certified to as new standard to facilitate this service and provide maintenance and spares.

For Further details contact:

Tim Otter, Chief Executive

Lutra Associates Limited | The Byre | Red Lion Court
Church Hill | STALBRIDGE | Dorset | DT10 2LR | UK

Tel **44(0)1963204239**

Mob **44(0)7748090802**

tim.otter@lutra-associates.com





When Success is Vital

Introducing the new Trilobyte™

Our newest line of helmet lights, in several generations of increasingly advanced technology.



Waterborne Operations

Pull-pin and water activated life jacket and emergency raft lights

Overt and Covert options available



I.F.F, C² & Personnel Recovery



We offer a wide array of portable beacons with advanced technology that allows users to program unique flash signatures (overt and covert), synchronize flash patterns, and more



Expeditionary Airfields and Landing Zones

Powerful, remote operated landing zone systems that can be set up in any terrain and adjusted to required level of visibility. Available for large aircraft, helicopters, beach head marking and more



Vehicle Illumination & Identification

Enhanced driver night vision and unique identifier signals for humvees, ATVs, and watercraft





The Trilobyte™

The latest line of helmet lights from Adventure Tactical brings together over two decades of experience in designing and developing solutions to the complex needs of IFF and C² practices in high stress environments.

The simpler models of the Trilobyte™ offer highly reliable performance at a competitive price point, while the more premium models make full use of our award winning patented technologies, delivering cutting edge features that are only available from Adventure Tactical.

Basic Features

The Trilobyte™ has a rounded design free of snag hazards. Its sandwiched polymer construction provides superior impact resistance. Like the majority of our product offering, it is waterproof up to 100 metres.

User Interface

One of the great achievements of the Trilobyte™ is its intuitive design that organizes a wide range of functions in an easy to navigate system. Two control switches on the left and right sides of the light control output colour and functions, while the two side buttons can adjust output intensity within 5 levels. All positions feature unique raised position nubs that allow for positive tactile feedback, ensuring controlled operation of the light.

Dual Polarity Program Switching®

Pressing and holding the two side buttons for specific lengths of time (varying from 1, 3 to 6 seconds) will toggle the Trilobyte™ through its various programs: IR, Visual and - in more advanced models - Programming Mode. This effectively prevents accidental overt identification and separates programming settings from in-field functions.

The various modes available in each Trilobyte™ are accessed by pressing and holding the two side buttons, labelled (+) and (-), and counting to a designated number of seconds before releasing.

Modes include IR Mode (default), Visual Mode, and Programming Mode on specific models.



Output Colours

The majority of Trilobyte™ models feature four output colours: Red, Green, White and IR. The most affordable model, the Trilobyte™ Base, simply has White and IR. SWIR output is also available in the Trilobyte™ Gen5, one of our premium options. SWIR and IR outputs are always separated from visual outputs through our Dual Polarity Program Switching®.



AutoSync™ Technology

With very few exceptions, every model of the Trilobyte™ features our patented AutoSync™ Technology. This allows for synchronized group flashing using a highly encrypted RF ad hoc mesh network. This is ideal for immediate group identification, even in environments with large amounts of light pollution.

Mockingbird® Technology

Mid to high tier models of the Trilobyte™ contain our Mockingbird® Technology, allowing for the recording and playback of custom flashing signatures which are saved into the product's internal memory until reset.

Signatures can be recorded with any external white or near IR light source, including sunlight. No external tools are needed.

Trilobyte™ models with Mockingbird® Technology can record and playback custom flashing signatures using any external white or IR source of light, including sunlight.



Broadcast Group AutoSync™

The most advanced iterations of the Trilobyte™ combine our AutoSync™ and Mockingbird® Technologies, resulting in groundbreaking flow and precision for in-field electro optic communications.

Groups of these Trilobyte™ units can send and receive recorded signatures to each other and flash in unison. Individual, synchronized flashing groups can be set up for specialized C² tactics. Unique identifiers can be easily and locally redefined if needed to relay operational status or disorient enemy intelligence.

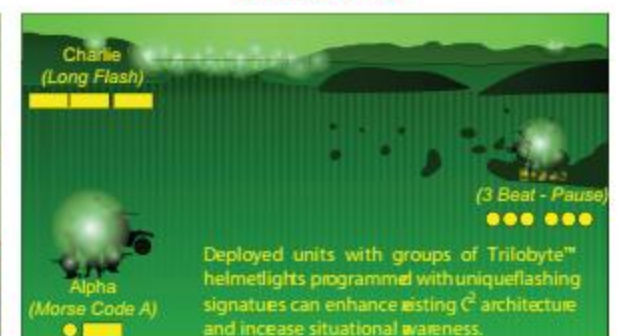
Deploying units with identifiable flashing patterns further enhances data from satellite / aerial imagery, presenting a refined Common Operating Picture that easily associates to in-field elevated and ground views.

While complimenting existing Command and Control Battle Command Systems, Trilobyte™ units that feature Broadcast Group AutoSync™ function independently from them and will continue to operate even if digital technology is compromised.

Aerial View



Ground View



Engineering for Specific Applications

We manufacture all of our products in house and pride ourselves on our ability to cater to the needs of our clients. We have already produced several custom mods of the Trilobyte™ to fit customer specifications.

Get in touch to learn more by emailing info@adventurelights.com or visiting our website at www.adventuretactical.com



BARRETT

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Stand N6-450

**PRC-4090
HF SDR
Tactical
Manpack**



**PRC-4091
HF SDR
Tactical
Mobile**



**PRC-4092
HF SDR
Tactical
Base Station**



At DSEI 2019, we will be previewing our new Tactical HF SDR Transceiver range together with a new HF tracking system. Tactical VHF, high power HF transmitters and interoperability solutions will also be on display.

Since 1976, Barrett Communications have been a specialist designer and manufacturer of tactical and commercial HF and VHF radio communications systems to military, security, government and peacekeeping organisations globally.

www.barrettcommunications.co.uk

PRC-4090 HF SDR



REMOTE WEAPON SYSTEM PRECISION FOR THE M

ULTRA LIGHT R150S

The R150S is the world's lightest remote weapon system capable of mounting and firing the M2HB 12.7 mm heavy machine gun precisely, on the move, over long range.

The R150S was developed to answer a requirement for a lower-weight unit that can be mounted on vehicles that have payload and roof loading limitations.

At around 50 per cent of the weight of the R400S, the RWS is able to mount 12.7 mm heavy machine guns, in addition to smaller-caliber 5.56 mm and 7.62 mm weapons.

The R150S has been tested on the Thales **Hawkei** and **Bushmaster** vehicles.



Pictured: **R150S** Remote Weapon System with 7.62 mm Heavy Machine Gun

SPECIFICATIONS	12.7 MM HMG	7.62 MM GPMG
Height above roof	670 mm	670 mm
Weight above roof - plus weapon and ammunition	177 kg	108 kg
Weight below roof - Control Group	21 kg	
Max ammunition load	200 rds	200 rds
Elevation/depression	+60° / -45°	+60° / -45°
Sweep radius	1 m	0.5 m
Firing stability	<1 mrad	
SENSOR UNIT	DAY CAMERA	THERMAL IMAGER
Detection range	> 12,000 m	> 12,000 m
Recognition range	> 5,000 m	> 4,000 m
Identification range	> 4,000 m	> 3,000 m



Pictured: **R400S Mk2 D-HD-4X** Remote Weapon System
with 30mm Cannon / 7.62 mm Coax / Javelin Anti-Tank Guided Missile

HEAVY FIREPOWER R400S Mk2-D-HD

Precise mobile engagements beyond 2 km with 30 mm lethality are now a reality.

The R400S Mk2-D-HD, configured with a 30x113 mm cannon and coaxial machine gun, with ATGM options provides light vehicles with unprecedented access to firepower normally reserved for much heavier (armoured) vehicles.

First round hit probability is enhanced by a sophisticated ballistic solution system that takes into account various parameters such as weapon and ammunition type, range, atmospheric conditions, target motion and vehicle attitude.

The R400S Mk2-D-HD is the selected RWS for the ADF **Australian Boxer** - Land 400 Phase 2 (Combat Reconnaissance Vehicle Capability) Project.

SPECIFICATIONS	DUAL CONFIGURATION M230LF/7.62 MM GPMG	M230LF	12.7 MM HMG	7.62 MM GPMG	40 MM AGL
Height above roof	900 mm	900 mm	714 mm	740 mm	714 mm
Weight above roof - plus weapon and ammunition	408 kg	355 kg	295 kg	230 kg	294 kg
Weight below roof - Control Group	21kg				
Max ammunition load	M230LF - 160 rds 7.62 mm - 400 rds	150 rds	500 rds	1000 rds	96 rds
Elevation/depression	+45° / -10°	+45° / -10°	+60° / -20°	+60° / -20°	+60° / -20°
Sweep radius	1.5 m	1.5 m	0.9 m	0.5 m	0.5 m
Firing stability	<1 mrad				
SENSOR UNIT	DAY CAMERA		THERMAL IMAGER		
Detection range	> 12,000 m		> 12,000 m		
Recognition range	> 5,000 m		> 4,000 m		
Identification range	> 4,500 m		> 3,000 m		

PARTITION PANEL SYSTEMS

MS Instruments

MS Instruments, in partnership with Sector Associates, is very pleased to announce a significant contract with a European partner for the supply of our ballistic Partition Panel Systems (PPS)



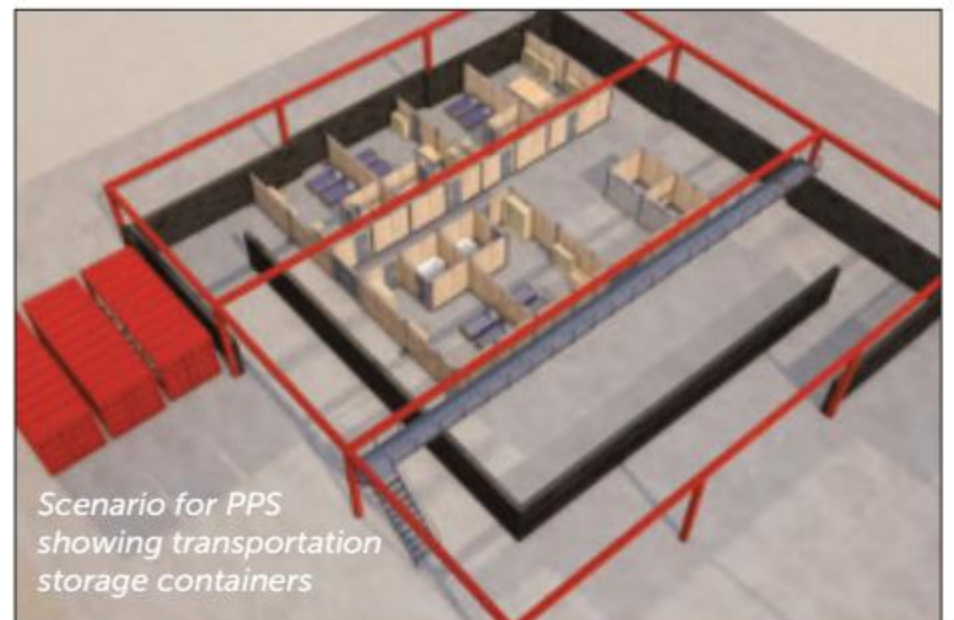
Scenario for PPS

PPS has been designed in consultation with Special Forces and Police Firearms specialists. In addition to the current contract, we are seeing significant worldwide interest with an imminent opportunity for UK MoD.

PPS is a unique, patented system that offers affordable, modular and moveable training houses to enable specialist Military and Police Forces to undertake Close Quarter Battle (CQB) training in rooms and corridors and rapidly re-configure them into any layout or scenario allowing rehearsal in replicas of current or future operations and to keep training fresh. The ballistic system achieved accreditation from the British Army (TAS) and has been approved by the UK MOD.

Now in full production, PPS is the only stand-alone CQB system that can be attacked with live fire and forcibly entered, yet can be assembled by just two people at a rate of a panel every 60 seconds. The system is modular and very simple enabling CQB scenarios to be built without the need for overhead rails or qualified crane or fork truck drivers. There are three versions: Ballistic, Heavy Duty (HD) and Lite, and all three versions can interconnect if required. Its unique retractable castor wheel base system allows heavy panels to be easily and rapidly moved by just two people; Lite panels can be moved by one person. All systems come in specially configured 6m modified ISO shipping containers allowing them to be moved easily to new training locations and stored securely long term when not in use.

Ballistic Panels have an armoured steel core and are proofed to 5.56/.223/7.62 and have bulletproof joints and corners along with a bullet trap system that prevents "splashback". Heavy Duty Panels are similar to the Ballistic Panels but do not have an armoured steel core and are



Scenario for PPS showing transportation storage containers

Scenario for PPS showing
Ballistic Panels



used to where live ammunition will not strike and are suitable for Paintball or CQT ammunition. The PPS Lite Partition Panel System is a lower cost but still durable option that can be very rapidly assembled into a CQB training scenario by just one person. Panels can resist Paintball and CQT ammunition. As with Ballistic and HD, Lite Entry Panels can be rapidly reconfigured from doors to windows to hatches to arches or blanked off and are able to sustain a reduced level of MOE attack.

Entry Panels for use within Ballistic or HD Partition walls can incorporate doors (easily changed from left to right hinge, in to out opening) or can be rapidly changed to windows, hatches, counters or arches or can be blanked off to alter the route through the scenario. Doors can be attacked with sledgehammers for reduced level MOE exercises. An up-rated MOE door system is available for full force MOE attack. The system is self-standing and does not require bracing back to other structures unless used on board ships at sea.

A SmartApp is provided loaded on a computer tablet providing many different room and corridor layouts representing street layouts, apartments, offices, shops, banks, discos, restaurants, hotel floors, conference rooms etc. Training Officers can easily enter their own layouts into the SmartApp and it will then provide step-by-step instructions for assembly. A simple laser system is used to set out the panels and ensure that floor intolerances do not lead to difficulty closing off the 4th side of any room.

All 3 PPS Systems are distinguishable from each other for safety reasons yet they can be interconnected if appropriate into a single scenario.

The MS Instruments pop-up target system with Location of Hit and Miss (LOMAH) targetry works with, and can be supplied as part of a full CQB shoothouse requirement.

MSI are pleased to announce two dramatic improvements to their range systems. Firstly the introduction of two versions of their Enhanced Cover Boards ECB - Patent Pending. ECB type 1 is for overlaying bulletproof range side walls or CQB partitions dramatically increasing the

life of their existing armoured steel protection. They can also be used to overlay floors and ceilings. ECB type 2 is for overlaying non-bullet proof range walls and CQB partitions to make them 100% bulletproof.

Secondly to announce the introduction of a multi-story version of their Lite CQB Partition system (patent pending) which still only uses a single hex wrench to assemble wall, floor and roof panels.

VELOCITY MEASURING SYSTEMS

MS Instruments Projectile Velocity Measuring Systems are well known throughout the world. They combine the type 858 Optical Detectors and timer unit with the sophisticated KINETIC variation of the ubiquitous BallisticDB software to provide outstanding accuracy and



A typical IVMS set up



858 & 817 – this is the 858 Optical detector and associated 817 timer Unit (now superseded by 818 timer)



reliability both indoors and out. A recent development is the addition of a lower cost indoor alternative known as IVMS (Indoor Velocity Measuring System). Useful where space or budget may be a limitation, IVMS offers two type

859 velocity screens which can be placed on a fixed baselength trolley to ensure a constant distance between detectors whilst remaining completely mobile. These screens offer a built-in light source and built in test of that light source. For timing/velocity calculation, MS Instruments has also developed a more competitively priced GPS synchronised timer unit (type 818) for use with IVMS and this is now also utilised on its larger PVMS systems. A testimony to the accuracy and dependability of the IVMS is the large number of orders from Far East customers that have been, and continue to be received.

BALLISTIC INSTRUMENTATION AND TESTING

MS Instruments has been supplying equipment and ballistic instrumentation to conduct many different types of ballistic testing for over 45 years and have also been conducting such tests at its own ballistic test range (Wiltshire Ballistic Services in Devizes) for over 30 years. The Company is pleased to be able to offer this extensive experience with equipping ranges with the most professional and reliable equipment that can be used to perform trials to a very wide range of international test standards

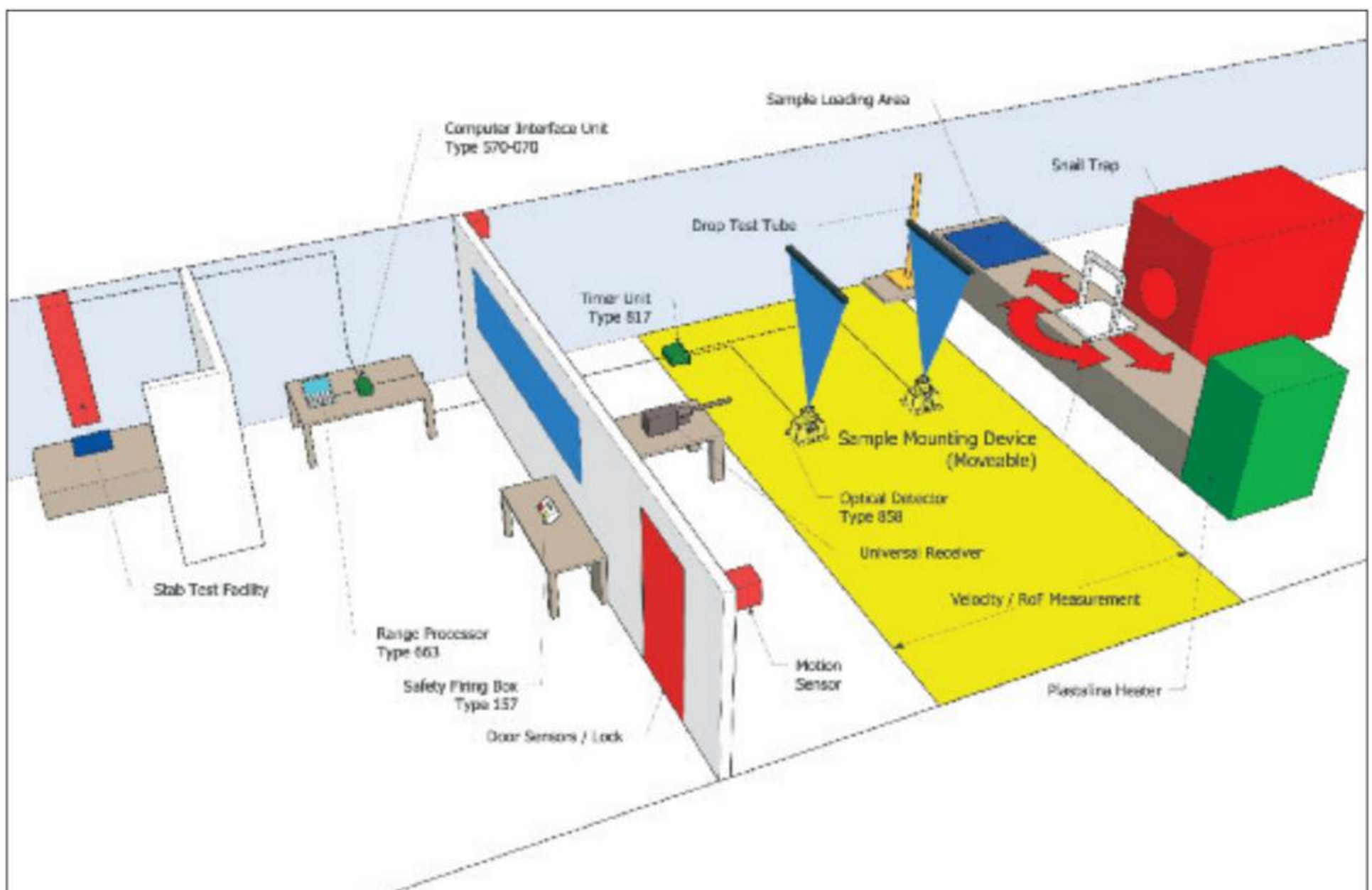
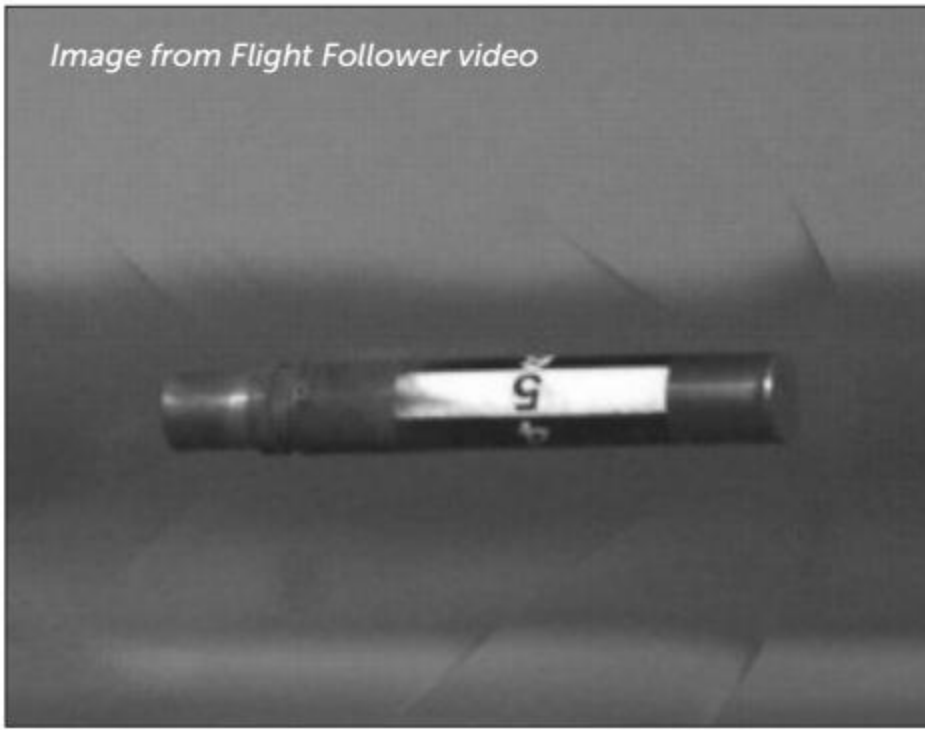


Image from Flight Follower video

AUTOMATED FLIGHT FOLLOWER AND MINI FLIGHT FOLLOWER

MS Instruments developed and produced the original Flight Follower concept over 20 years ago.

The system consists of a computer controlled triggered mirror positioned in front of a high speed camera and this mirror is programmed to rotate at the correct speed so that the camera "follows" the projectile. MS Instruments continue to refine and upgrade the design, and the latest version, the Automated Flight Follower (AFF) has an enhanced performance that allows any adjustments to be made remotely, rather than having to return to the Flight Follower to programme any alterations to the mirror rotation. This also removes the need for calibration. The combined functionality of the hardware and software greatly simplifies system operation without limiting flexibility. The Automated Flight Follower can accommodate a variety of cameras to suit the customers' needs.

The mini Flight Follower is a more compact, cost effective, turn key package that gives high performance along with convenience. It offers most of the functionality of the Automated Flight Follower except that use for elevated firings requires manual adjustment and is now becoming the "follower" of choice over the AFF with MS Instruments customers.

Acoustic trigger – type 588 acoustic trigger

MS Instruments

MS Instruments
Unit 4, Ravensquay Business Centre, Cray Avenue,
Orpington, Kent, BR5 4BQ, United Kingdom

T: +44 (0)1689 883020
sales@msinstruments.co.uk

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SOLIFOS
FIBER OPTIC SYSTEMS

Motorized NATO-reel with FO-Cu-rotary joint

- Reel and winding-frame are compatible with the NATO-reels commonly in use.
- The rotary joint allows for connectivity for data and power lines during deployment of the tactical cable.
- The motor drive allows for convenient reeling and unreeling of the cable.
- Typical applications are unmanned vehicles on the ground, in the air and in the water.
- Another application are vehicle-based control centres that are operated on the move while the cable is deployed (no RF Link needed).



Description of the solution:

In order to have connectivity while the soldiers are deploying a tactical cable there is a need for a rotary-joint. Solifos developed a Winding frame with a NATO-reel that includes the rotary-joint function for fiber optic signals and same time for electrical power lines. The motor drive eases the reeling and unreeling and can be operated by hand or automatized depending on the application. This device opens the door for applications that need permanent connectivity for data and power while the cable is reeled and unreeled. Typically, this function is in use for unmanned vehicles on the ground, in the air or in the water. Solifos is now ready with the complete solution to provide permanent connectivity for data in the range of more than 10 Gb/s and power up to 24 Kilowatts. All the components are low volume and weight e.g. the tactical FO-Cu-hybrid-cable BRUpowerfield slim has a diameter of 3.8mm, a weight of 2.5kg / 100m and is able to transport power up to 9000 Watts. This enables the user of a UAV based hover-mast to carry heavy loads as GSM-base-stations in the height of 200m permanently. Another application is the control centre that operates a radio station. The operators will start up the equipment at the station while the vehicle with the control centre is nearby. Then they deploy a tactical cable between the station and the control centre while the system is up and running. If the tactical cable is FO-Cu-hybrid, it can transfer data, RF-signals and electrical power to remote operate and remote supply the radio station.

Solifos has more than 20 years of experience in tactical fiber optics and is a company that offers military devices for harsh environment field use. The very robust tactical fiber optic data links and electrical power transmission is ready to use after the soldiers deployed just one cable. The benefit for the user is, that there is just one cable deployed and both, the data- and the power-network is ready to use. The tactical cable is rodent proof and takes roll over of heavy vehicles. All the components are low volume and weight and offer high ergonomics. This saves installation time, work force, space in the vehicles and in stock, and ease the logistics and maintenance. All together it saves money for the forces that do perform the service. Solifos offers a full solution with the product range including tactical cable, reels, winding frames and backpack, deployment aids, masts, tools, measurement devices, repair-kit, distribution boxes including switches, media- and power converters to provide the connectivity required in the whole network with customized power and data interfaces. The Solifos engineers will adapt the solution to fit to your existing or new military system by providing the needed signal at the correct place.



www.solifos.com

Visit us at:
DSEI London,
10-13 September 2019
Stand N6-450



Modern data intensive communications require solutions which can support extended transmitter operations in demanding conditions. At DSEi Barrett Communications (Stand N6-450) will be exhibiting the liquid-cooled 4075 high power software-defined radio (SDR) HF transmitter which comprehensively meets this need.

The 4075 couples 500W and 1kW linear amplifiers with Barrett's 4050 SDR HF transceiver in a package that offers continuous coverage from 1.6-30MHz and a range of communication modes.

The 4075 amplifier has a unique, advanced liquid cooled solid state design which reduces the requirement for forced air cooling, resulting in less power consumption and a better working environment. This innovative cooling system allows the transmitter to run continuously at optimum temperatures, resulting in greater reliability and extended service life.

The 4075 transmitter has 2G and 3G Automatic Link Establishment (ALE) options and can be controlled remotely via IP or WiFi. It is field re-programmable via USB and Ethernet allowing the end user to update system software, and a micro SD card is also available which provides enhanced flexibility for system updates, language, and display customising.

The Barrett 4075 HF transmitter provides the right solution for those who operate in austere conditions. Peacekeepers, military forces, security organisations and non-government organisations all require easy to use, robust and reliable long-range data communications equipment with reduced logistic demands. The Barrett 4075 HF Transmitter is the answer to this requirement.

- **Advanced liquid cooled solid state design**
- **1.6 – 30 MHz continuous coverage**
- **500 Watt & 1KW continuous duty cycle (100%)**
- **USB, LSB (SSB), CW, FSK, AM and Digital Modes**
- **Remote control via IP and WiFi**
- **Compatible with existing 4 & 6 digital selective calling radio networks**
- **2G & 3G Automatic Link Establishment (ALE) options**
- **ARINC ICAO Annex 10 Aeronautical Selcall option**
- **Field re-programmable via USB and Ethernet**



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Lutra Associates Ltd

Helps 4GD Progress in Training and Simulation Markets

Lutra Associates Limited the Dorset based consultancy and advisers has been helping 4GD (The trading name of Fourth Generation Development) access markets and achieve its marketing expansion goals.

By providing market access advice and operational support Lutra has been able to help 4GD fast track itself into a variety of programmes and networks where its products and skills (Immersive Modular Shoot House Creation, Training Weapons and Virtual Simulation) are needed. In addition 4GD has been able to take advantage of Lutra's extensive overseas network to access these markets or improve contacts within them.

The base product used by 4GD in its Urban CQB ranges, SimWallTM, offers unrivalled reconfigurability and modularity. When backed up by the state of the art After Action Review

(AAR), hyper realistic targetry, Special Effects (Which crucially immerse all of the students' 5 senses) of their flagship product, 4GAV, the trainee is subjected to varied and interesting training and rapid mission rehearsal. This all makes the 4GD Shoot House (*The gallery of a shoot house is illustrated above*) hugely popular with operators, instructors and students alike. The demonstrable value for money and ease of maintenance makes the systems popular with the planners and financiers as well.

4GD has an impressive list of clients and order backlog for its urban CQB facilities, simulation products and training weapons and ammunition. There is also tremendous interest in 4GD's ability to combine the base software for this simulation with a data logging capability that monitors the physiological status of students on the ranges or while undergoing synthetic training.

The slowly increasing realisation within the military, police and security services that virtual reality, in the dismounted field, is a much more complex and demanding genre than first thought has led to a number of

products being rushed to market which have then fundamentally disappointed users.

This realisation and other related issues were taken on board by 4GD from the very start. As a result 4GD's VR developments have been methodical and thorough concentrating on realism, core movement and finding niche areas that benefit from VR rather than trying to find a solution that tries to achieve everything. Those who have been shown the development prototype have all been very impressed.

More details on 4GD can be seen here:

https://www.youtube.com/channel/UCzz4NINtsa7qbswJafQmYtw/videos?view_as=subscriber

and at stand **N8-152** at **DSEI 2019**.



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Tony Nutt (Managing Director)

T. +44 (0) 1392 881545

E. sales@militarysystems-tech.com

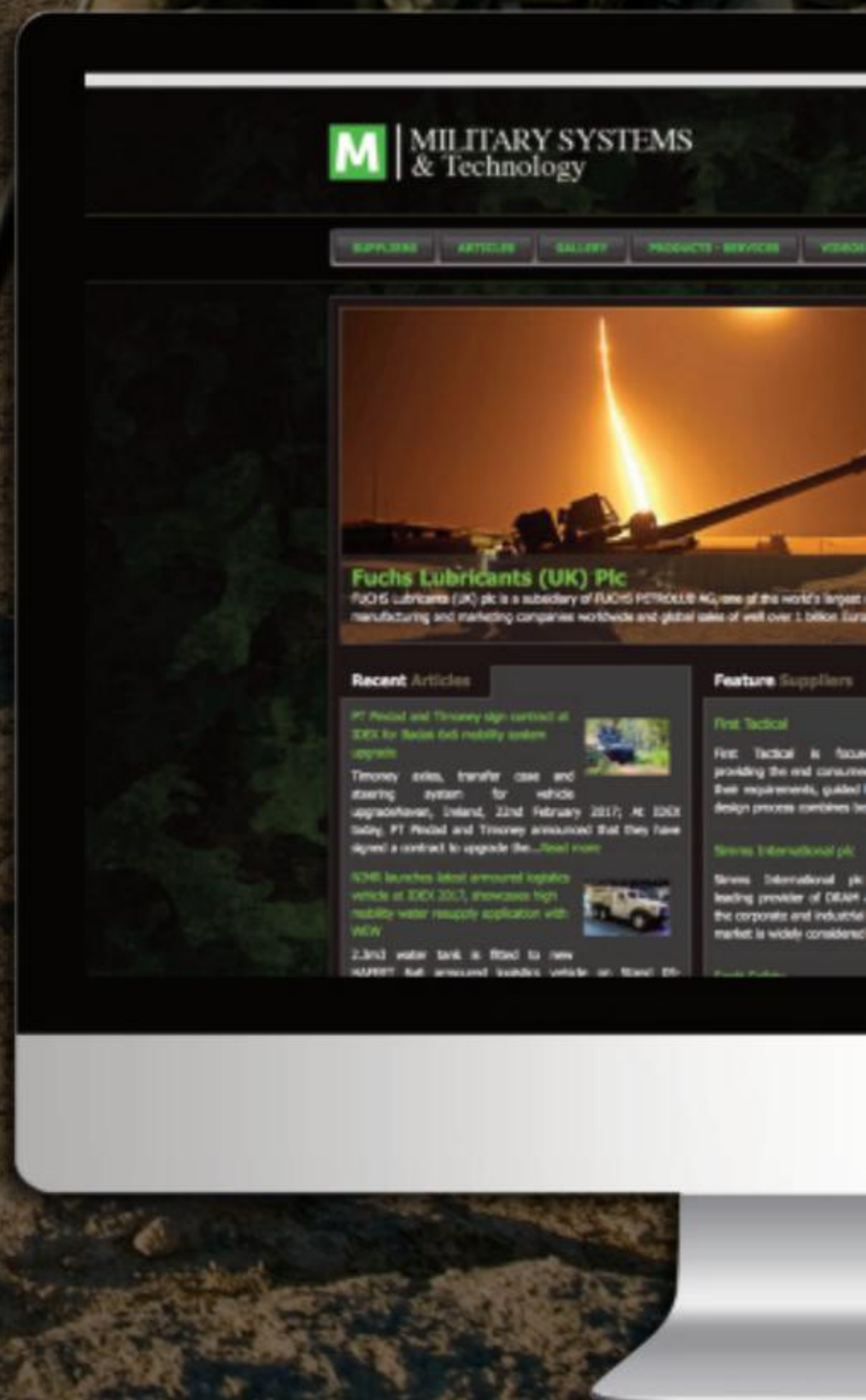
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T. +44 (0) 1392 881545

E. guy@militarysystems-tech.com

Westlake Publications Ltd

Worth Cottage, Hele, Exeter, Devon,
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