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MILITARY SYSTEMS & Technology

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The Defence Suppliers Directory Magazine

FEATURING...

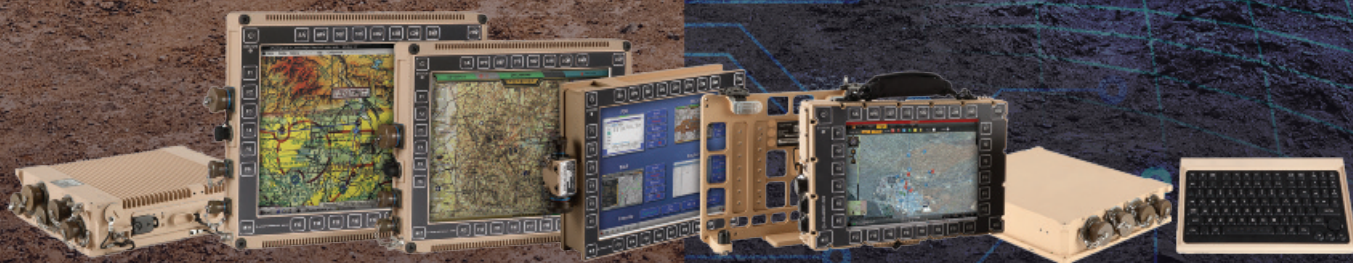
LEONARDO DRS
KEWELL CONVERTERS LTD
LINCAD
OMNETICS
INTERFACE CONCEPT
DISPLAY TECHNOLOGY
PARAMOUNT PANELS UK
AVON
PLASTPACK DEFENCE
LUTRA ASSOCIATES
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Cover image - Leonardo DRS
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Welcome to the December 2021 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 magazine is designed to keep you up-to-date with latest news and events within the Defence Industry's Governing Bodies, Organisations and Companies.

A Multi-Media Portal for the International Defence & Aerospace Industry

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

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Plus...

POLYAMP
HORSTMAN
WILL-BURT
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HMG PAINTS
OXLEY
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CP CASES

... & much more



Leonardo DRS Assured Positioning, Navigation, and Timing

U.S. military positioning technology relies heavily on Global Positioning System (GPS). Yet, in recent years, jamming, spoofing and other forms of interference have grown in frequency and severity. This creates risks for military forces when encountering technologies that degrade the GPS capability on combat vehicles. The solution to this challenge is Assured Positioning, Navigation, and Timing (A-PNT) – a way to provide accurate position, navigation and timing (PNT) information at all times under all conditions. Given this threat, Combatant Commanders are requesting alternate PNT systems to GPS for their maneuver formations.

Leonardo DRS developed a modified TRL-9 production Data Distribution Unit computer (DDUx II) with embedded A-PNT capabilities to provide a reliable and accurate mounted navigation and timing solution in GPS threatened environments. The embedded technologies enabling the company's A-PNT solution possible are collectively titled Assured Positioning, Navigation and Timing Converged Computer Embedded & Scalable or AC²ES.



AC²ES is a fully modular and scalable A-PNT option allowing the mounted ground vehicle fleet to leverage its existing investment in computing and display hardware, and bridge the gap to CMOSS Mounted Form Factor (CMFF)

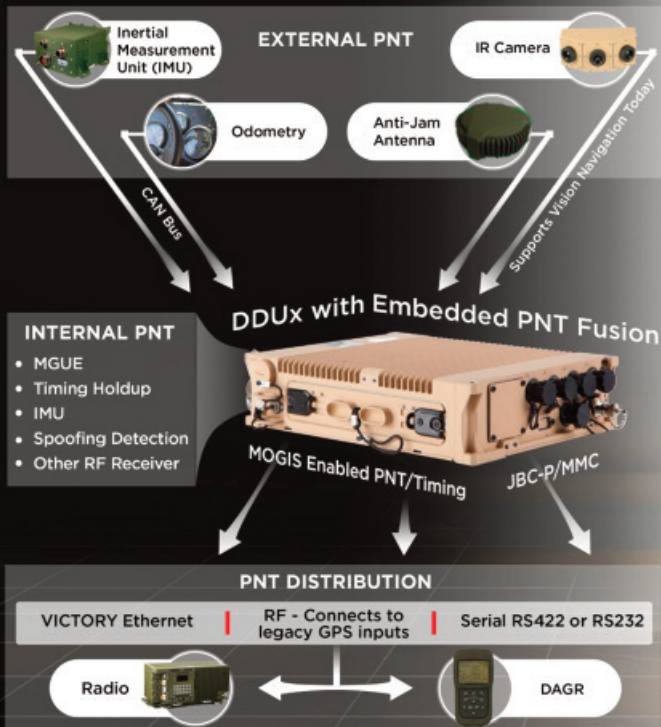
with an affordable, scalable upgrade. The DDUx II PU contains a powerful quad-core Xeon Intel processor, which can host a variety of CMFF A-PNT applications, including Vision Navigation and pntOS. AC²ES is a solution to Global Positioning System (GPS) disruption designed to provide A-PNT information at all times. Developed with Size, Weight, Power and Cost (SWAP-C) efficiency in mind, AC²ES is embedded in our widely used Data Distribution Unit – Expandable (DDUx II) Processor Unit (PU). The DDUx II and military variants are currently fielded in the U.S. Army and U.S. Marine Corps. The AC²ES capability is easily implemented without additional space or weight requirements. The DDUx II also allows for integration of A-PNT functionality with the Battle Management System (BMS) in a currently fielded Line Replaceable Unit (LRU). The DDUx II PU is the ideal source of A-PNT not only because it is a critical user of PNT, but also because it can provide A-PNT distribution to all other devices needing PNT within the vehicle without adding any additional SWAP.

The vehicle operator uses the BMS's Graphical User Interface (GUI) on the

Multi-function Rugged 12.1" display to view and manage Mission Command functions, GPS, and A-PNT functions on a single pane of glass, including distribution to all vehicle PNT users. AC²ES provides A-PNT capability by augmenting standard military GPS PNT sources with technologies such as anti-jam, anti-spoof, M-code receivers, additional RF sources, vehicle Infra-Red (IR) sensor vision navigation, wheel rotation and inertial measurement units (IMUs). The fusion engine merges and prioritizes all PNT sensor data to provide a reliable, GPS-denied navigation solution during real world jamming and spoofing attacks. The AC²ES capability operates standalone, or while hosting the vehicle's BMS and is controlled via its GUI.

In the modern battlefield, it is equally important to know accurate "time" as it is to know your position. If timing information from the GPS is unavailable or cannot be trusted, it is critical to have access to other sources for execution of the mission. AC²ES offers a choice of multiple timing holdup modules that increase accuracy proportionately with cost. AC²ES offers a unique benefit to

A-PNT Converged Computer – Embedded & Scalable (AC²ES)



Beyond GPS: Tiered A-PNT Solutions For All Warfighters

- Utilize Existing Footprint
- Leverage the Existing Investment
- Modular, Scalable, and Upgradable
- Converged C2/SA and A-PNT
- Extensible fusion of A-PNT capability with tactical computing



LeonardoDRS.com/A-PNT

The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement. Photo: army.mil, Photo Credit: Staff Sgt. Nayssa Canfield

Platform Integrators since they are able to select the accuracy level needed for their mission purpose and avoid paying unnecessary costs for higher capability levels. Designed with extensibility and future growth in mind, Customers are able to tailor their system configuration based on the military units mission profile, operational needs, and budget. This ability to tailor the configuration

offers different tiers of AC²ES capabilities throughout the echelons of the modern fighting force. All Warfighters now have access to resilient A-PNT capabilities that integrates with existing Leonardo DRS tactical computing systems. As the enemy adapts, AC²ES provides the fighting force with the system flexibility to conduct modular upgrades, facilitating precision mission execution.

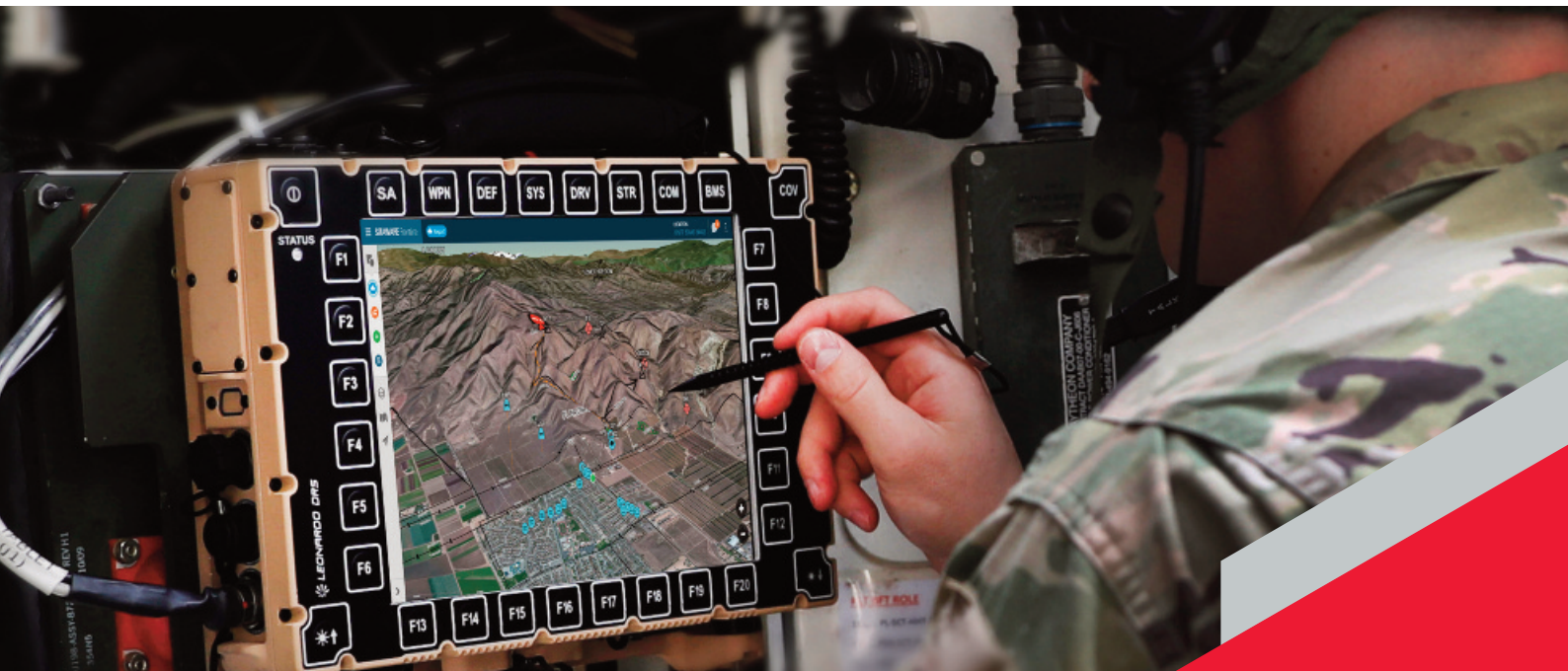


This new A-PNT system is comprised of embedded RF components (M-code GPS, Other RF Receivers), and an internal micro-electromechanical systems (MEMS) grade Inertial Measurement Unit (IMU) with Magnetometer, vehicle odometry input signal, and an internal GPS trained Chip Scale Atomic Clock (CSAC) for precision timing holdup during RF outages.

This cutting-edge technology has already been selected by Military & Aerospace Electronics as a Gold level honoree in their Innovators Awards category. The Gold award recognizes

an excellent innovation that makes a substantial improvement over previous methods employed, approaches taken, or products/systems used.

To learn more about AC²ES, please visit LeonardoDRS.com/A-PNT.



MILITARY & DEFENCE FOAM PACKAGING

Thinking outside the box to meet defence requirements

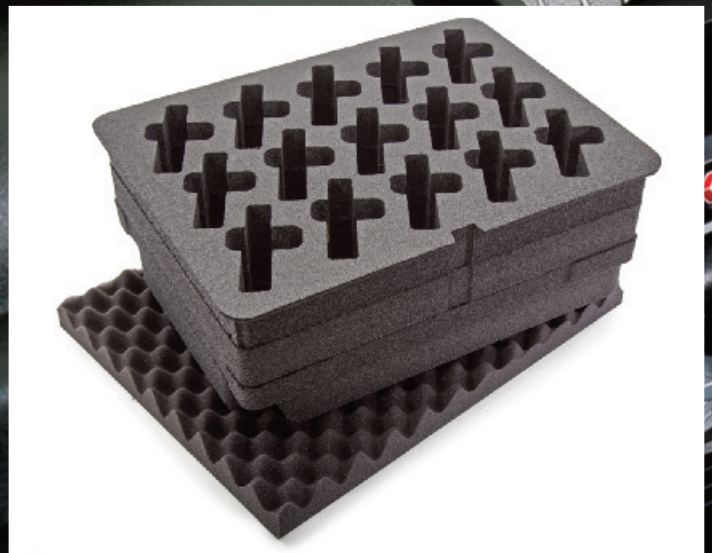
Military foam packaging demands a much greater attention to detail than commercial packaging solutions. A large amount of military cargo requires careful packaging and handling due to the sensitive materials. The equipment must be protected from physical impacts, climate changes and any biochemical hazards too. Military equipment is often transported around the world, which is why the defence foam packaging needs to be of the highest quality to ensure safe transportation.

Kewell Converters take into account the likelihood of physical impact and others factors in the transportation of sensitive goods. That's why our military foam packaging is produced to the highest possible standard and we take all of these things into consideration. Our expert team has a great deal of experience in producing military foam packaging for all kinds of purposes.

OUR MANUFACTURING PROCESS

We understand the needs for high-quality military foam packaging and manufacture products for this purpose. Kewell Converters Ltd. manufactures foams that meet or exceed the following military requirements:

- *Foam for general purpose packaging.*
- *High density foam for general purpose packaging.*
- *Foam for explosive compatible packaging*



Fill out our online form for a quote on your defence, aviation or industrial packaging requirements. You can also order free samples from us.

MILITARY FOAM APPLICATIONS

We supply high performance protection for applications such as helmet inserts or aircraft ejector seats. In addition to which we supply packaging, case inserts and bespoke foam parts for applications such as ordinance packing & protection, weapons carriage and bespoke designed flight cases and inserts machined to fine tolerance when accuracy is critical. Our engineered military foam is perfect for these applications as it has a number of properties that make it the ideal material. This includes the low mass, energy absorption, durability, strength under compression and tension that engineered foam packaging offers.

Static dissipative and conductive foams also find many applications in the military sector.

MILITARY GRADE FOAMS FOR PROTECTION, PERFORMANCE AND DURABILITY

Advantages

- Tested and approved
- Light weight
- Energy absorbent
- Long-life durability
- Low odour
- Explosives compatible
- Static dissipative and conductive
- High impact resistance
- High tear strength
- High tensile strength
- High resistance to compression set

At a glance

STANDARD	DESCRIPTION	MOD GRADE	PRODUCT
DStan 81-116/3 Type GP	"Expanded polyethylene sheet - general purpose"	Grade A Grade B Grade C	Plastazote LD24 Plastazote LD33 Plastazote LD45
DStan 81-116/3 Type QX	"Expanded polyethylene sheet - explosives compatible"	Grade A Grade B Grade C	Plastazote LD24 Plastazote LD33 Plastazote LD45
DStan 81-124/2 Type QX	"Expanded polyethylene sheet and mouldings, explosives compatible"		Plastazote LD33
DStan 93-101	"Expanded polyethylene sheet, high density, for general purpose"		Plastazote PK80
DStan 81-125/3	"Electrostatic conductive foam sheet"		Plastazote LD50CN
DStan 93-117	"Static dissipative low density. Polyethylene foam"		Plastazote LD40SD
DStan 81-119/3	"Cross-linked expanded ethylene-vinyl acetate sheets and mouldings"		Evazote EV50 Evazote VA25

For 'mission critical' packaging

- Ordnance protection
- Missile cradles
- Weapons case inserts
- Rifle case inserts
- Ruggedised case inserts
- Electronics device protection
- Flight case fitments

For high performance protection

- Personnel protection
- Body armour
- Helmet inserts
- Aircraft ejection seats
- Tool control inserts
- Sleeping mats
- Buoyancy devices
- Punctureproof' marine fenders

For the very best defence foam packaging then speak to us about the right foam application for your military foam packaging or aviation requirement. Our defence foam packaging is made out of the highest quality closed cell foam materials. Major international aviation and defence OEM's trust Kewell to deliver and you can too. So, when failure is just not an option Kewell Converters are here to help!



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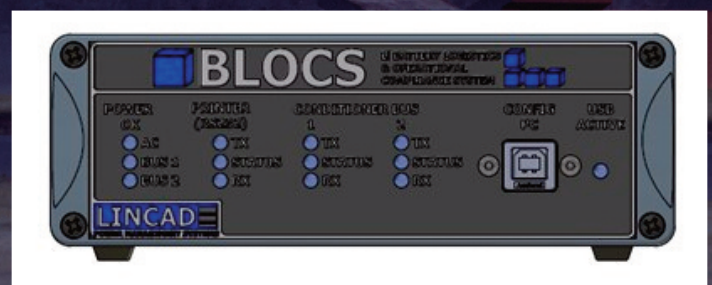


Lincad's BLOCS label printer

Makes global transportation of military batteries easier than ever before

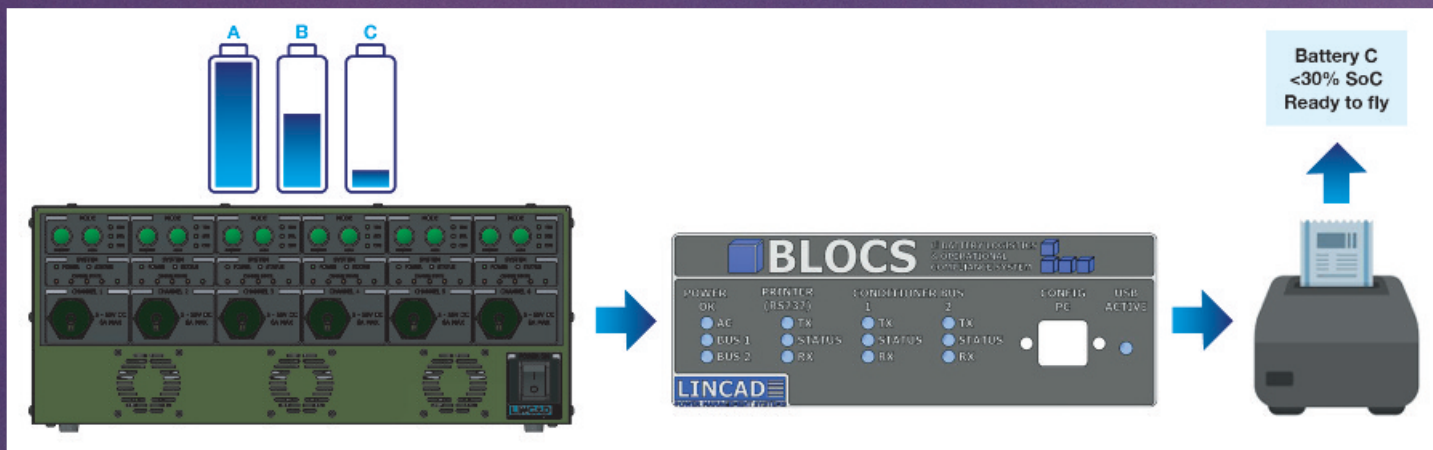
Lincad has developed an innovative battery logistics and operational compliance system (BLOCS) that allows label printing of battery state of charge. It connects directly to compatible in-service Lincad battery conditioners and chargers and enables batteries for military equipment to be transported safely around the world with ease, in line with IATA regulations.

The BLOCS label printer automatically prints a status label for each battery being charged or discharged, showing accurate state of charge data and other battery information. The system allows up to 16 conditioning devices to be connected at the same time for rapid processing and a streamlined logistics process. Using Lincad's six channel Armada conditioner, up to 192 batteries can be processed simultaneously.



IATA regulations require that lithium-ion batteries have a state of charge of 30 per cent or less when transported by air. The BLOCS label printer system ensures that batteries being transported for mission critical defence purposes comply with these stringent regulations. The system is available as a factory add-on option and works as an automated, stand-alone process that does not require any external inputs once set up.

The system allows different conditioner and charger types to be used simultaneously. This provides maximum flexibility to suit the logistical demands of defence sector end users. The printed status



labels provide accuracy and full traceability back to each conditioned battery.

Peter Copplesstone, Operations Director at Lincad says: "Our versatile and highly efficient label printing system has been specifically designed to meet battery charging and management demands of our own lithium-ion LIPS battery suite, as well as batteries of other electro chemistries. This means that our

customers can not only rely on Lincad for rapid, accurate, up-to-date state of charge status labelling for Lincad products, but also for batteries from other original equipment manufacturers. Such versatility is especially critical for defence equipment that needs transporting to front lines and other demanding military environments."

As well as the defence and military sectors, Lincad's range of battery conditioners and chargers in conjunction with the BLOCS label printer can also be used for the safe transport of industrial and commercial lithium-ion batteries.

www.lincad.co.uk





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SEE IT IN ACTION



Bath, 12th October 2021 – Horstman, a company of the RENK Group, is delighted to announce that it has won a multi-million pound manufacturing export contract.



Horstman



Puma Infantry Fighting Vehicle
(Image source KMW website)

Horstman has been awarded a follow-on contract for the immediate supply of spare Hydrostruts® suspension units in support of the German Army PUMA Infantry Fighting Vehicle programme.

This contract award follows over ten years of production of, and support to, the PUMA Infantry Fighting vehicle, for which Horstman has delivered over 4,000 Hydrostruts®. PUMA is delivered to the German Army by Projekt System & Management GmbH (PSM) – a consortium of Krauss-Maffei Wegmann and Rheinmetall Landsysteme.

This multi-million pound contract maintains our long heritage of providing combat mobility solutions in support of British, NATO and worldwide military forces, and clearly demonstrates our excellent relationship and proven quality as an overseas supplier to the PUMA partners.

“This is excellent news – our team in Bath has worked hard to win this contract” says Ian Pain, CEO Horstman Group. ***“It is also testament to the close and enduring defence ties between the UK and Germany, and shows our customer and RENK’s track-record in driving UK investment. This has also been in evidence on the UK Boxer programme -***

with current contracts already in place and more Boxer support and artillery variants being considered.”

Russel Blomfield, Operations Manager Horstman Group said, ***“After all the challenges of the last 18 months, this is great news for the operations team who produce the Hydrostruts®. They work hard and take pride in a quality product. They now have a new output challenge, which they will take in their stride.”***

About Horstman

Horstman – a company of the RENK Group – has been headquartered in Bath since 1913, with business units in the UK, the US and Canada. It delivers mobility solutions for the global wheeled and armoured markets’ hardest challenges. Horstman provides world leading design and manufacturing capabilities, with our customers benefiting from our time-tested pedigree in innovation, product development, manufacture and defence project management in heavy armoured and tracked vehicle suspension systems.

Horstman designed and manufactured products have been integrated for many years throughout multiple, battle proven, British Army platforms and for customers globally. For more information, please visit: www.horstmangroup.com

About RENK

Headquartered in Augsburg, Germany, RENK Group is a globally leading manufacturer of high-quality transmissions, engines, hybrid drive systems, suspension systems, slide bearings, couplings and test systems. The group serves a wide range of end-markets with a particular focus on armoured vehicles, defence and civil marine, power generation, plastics, oil & gas, and others. With over 3,000 employees, RENK Group generates annual revenues of over EUR 800 million. For further information, please visit: www.renk-group.com

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Horstman’s range of Hydrostruts®

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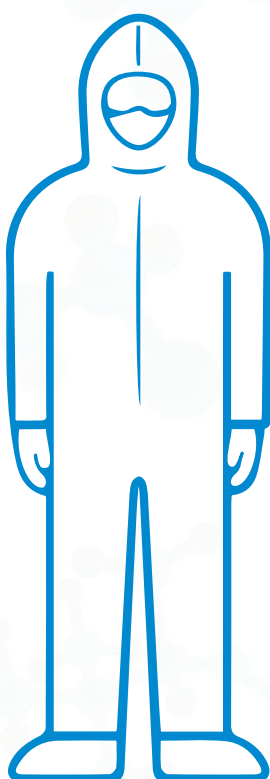
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FALCON	High	High	High	Low	Low	High	High	None
PHOENIX	High	High	High	Low	None	None	High	None
KITE	High	High	High	Low	Low	High	High	Low
CETAN	High	High	High	Low	Low	High	High	None
VIPER	Low	Low	None	Low	High	High	None	High
OSPREY	High	High	High	None	None	None	None	None

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Image: Adam Read, NFM Group

Omnetics to solve defence industry's connectivity challenges with new product launch

Omnetics Connector Corporation are leaders when it comes to custom-designed micro-miniature and nano-miniature connectors for aerospace and defence industry applications.



This has been the case since the company launched a little over 35 years ago. But recently, spurred by customer demand, Omnetics has been working hard on a new, much different product launch believed to be the biggest in company history. Eager to find out more about the new Kilo 360® product family, we spoke to Travis Neumann, Omnetics' Special Projects Manager, and Phil Simonson, the company's Vice President & CFO.

Simonson starts by explaining one of the ways the Kilo 360® launch differs from Omnetics' previous focus. ***"Omnetics' expertise has traditionally focused on custom, specifically designed and assembled components and connectors. Our challenge was to come up with a line of products, to do something that is an industry standard and bring that same level of quality and design that Omnetics' customers have come to expect. There are three distinct styles of connectors that we're working with, but if you look at all the permutations and combinations of options that we have, there would be many 10s of 1000s of different connectors."***

And for a connector company that built its success on miniature

connectors, this new line of products represent a slight increase in size for Omnetics. So, what prompted the company to take this direction and launch it as a brand new business line, and what types of customers is it aimed at? ***"It's something that our existing customer base has been asking us for years,"*** says Simonson. ***"It'll overlap with existing customers that we have, primarily in the military and aerospace industries, as well as some industrial applications as things move down in power and size requirements. These will help miniaturise connectors that they're already using, so we could see more growth in that area. Primarily, it's something that our existing customers are currently buying from other vendors that they've been requesting us to provide as well."***

Solving customer pain points

A long time before engineers even started on designs, Omnetics had been closely observing the existing market for this style of connector, paying particular attention to any common problems its own expertise and efficiencies could help solve for customers. Neumann believes that two critical pain points for customers are lead time and quality.



“One of the biggest pain points for us to solve for people is having them available and being relatively flexible to adjust to a different plating type, or something similar. We have a plan for stocking, much like a number of vendors. We also do the majority of the machining in-house. And we’ve done some things in the design of our product lines that allows us to use one machine part for a variety of finishes. So, in manufacturing we can stage raw materials to some extent or have a combination of those raw materials. Then, as customers order specific finishes, we just take from that and send it out. It saves us a few weeks of lead time on the front from machining; we basically go straight to plating and then we’re ready for assembly.”

Another customer pain point that Omnetics identifies is the “intermateability” of the connectors. Simonson explains that intermateable connectors haven’t always been the case with these styles due to a lack of official standards. **“Our challenge was to provide Omnetics’ level of quality to a connector that is truly intermateable with the others in the field, not just another connector that you throw out there that may or may not fit correctly or serve the needs of the customer,”** he says.

Neumann agrees, adding: **“People have basically been purchasing these connectors from one vendor, primarily. Other vendors have approached it in terms of the marketplace. As we found out when buying these connectors to integrate into solutions for customers, they don’t necessarily match up. What that may mean is that you could take two different vendors’ connectors, and when you fasten them together you see damage at some level on the threads, for example. We’ve also seen issues where**

customers use Company A’s connector for one side and Company B’s connector for the other side, and they have sealing issues. So, it’s all about us working through whatever those issues are and integrating solutions for that into our design.”

By focusing on solving these issues for customers in the defence and aerospace industries, and thereby providing these clients with the best quality and most reliable connectors, Omnetics has recognised a real opportunity in this area. **“It’s all about us getting into the game with these styles of connectors,”** says Neumann. **“We don’t want to come out with our version and then experience the same pitfalls as other vendors have, where our customers are saying ours don’t mate, or they leak, when they’re already using the front-runners for connectors”.**

Omnetics believes that the success of the Kilo 360® launch will follow as a result of this. Neumann concludes: **“When we do a good job, it’ll take care of itself. Customers will know that we’ve listened to what’s going on in the marketplace, and that we’ve taken care of the headaches they’ve been experiencing.”**

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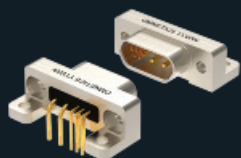
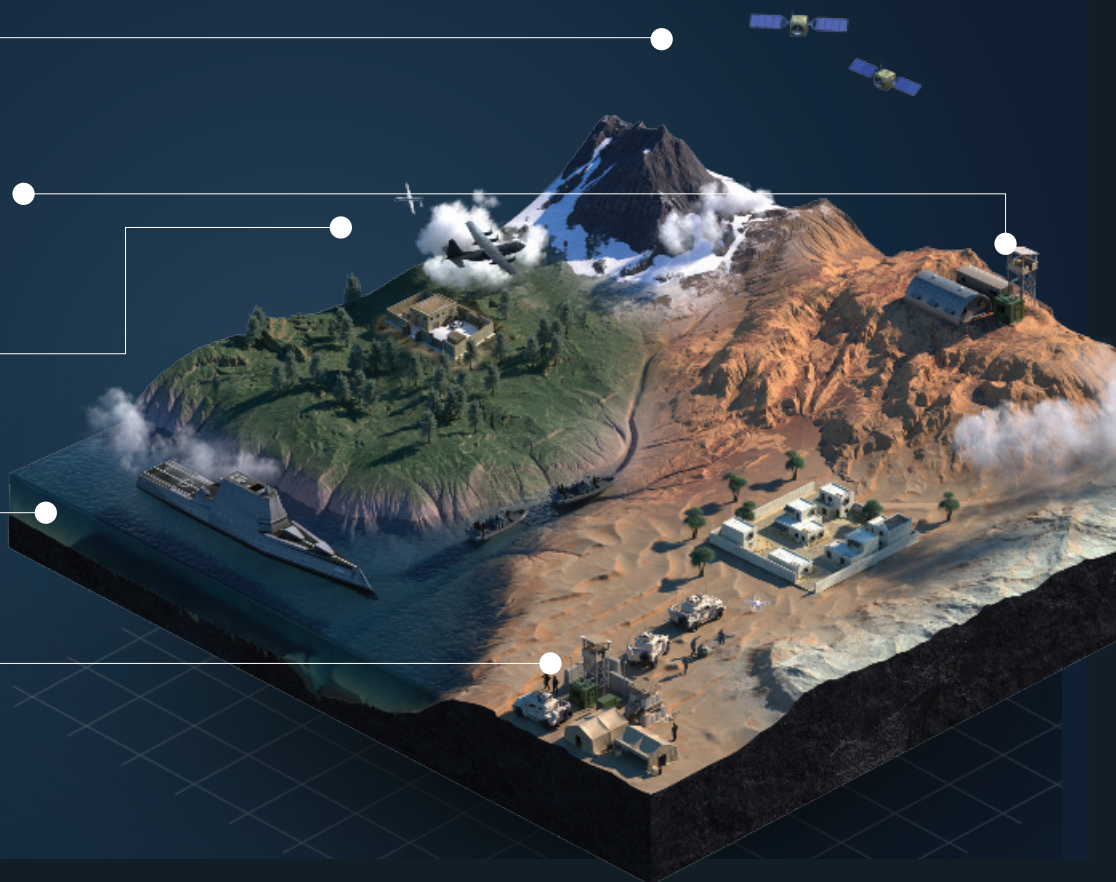
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Laser Comms



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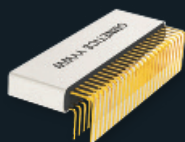
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MICRO - D



NANO - D



NANO STRIP



HIGH SPEED

Ruggedize micro-miniature interconnect solutions for high reliability applications.

Omnetics' connectors are proven to deliver exceptional performance in extreme environments for mission-critical applications.



Military Communications Advance for PPM Systems with New Trival Antennas and Masts

Military applications requiring antennas that operate in the lower frequency bands now have wider options for equipment following PPM Systems' new agreement to distribute Trival Antene antennas and masts in the UK. The deal means that PPM Systems' extensive range of antennas now extends all the way from 2 MHz to 40 GHz.

There are also lightweight vehicle antenna system options and a wider range of antenna systems suitable for use on portable equipment.

Masts in the new range include vehicle mountable and winch driven versions up to 18m in height, and can be assembled by two people or in some cases even by one person. They offer a range of compatible mountable antennas together with a rotation capability on some models for use with directional antennas.

"Trival's comprehensive antenna range is a perfect complement to our existing products in this area with its strong offering in the lower frequency bands," said Paul Cotterill, Business Development Manager at PPM Systems.

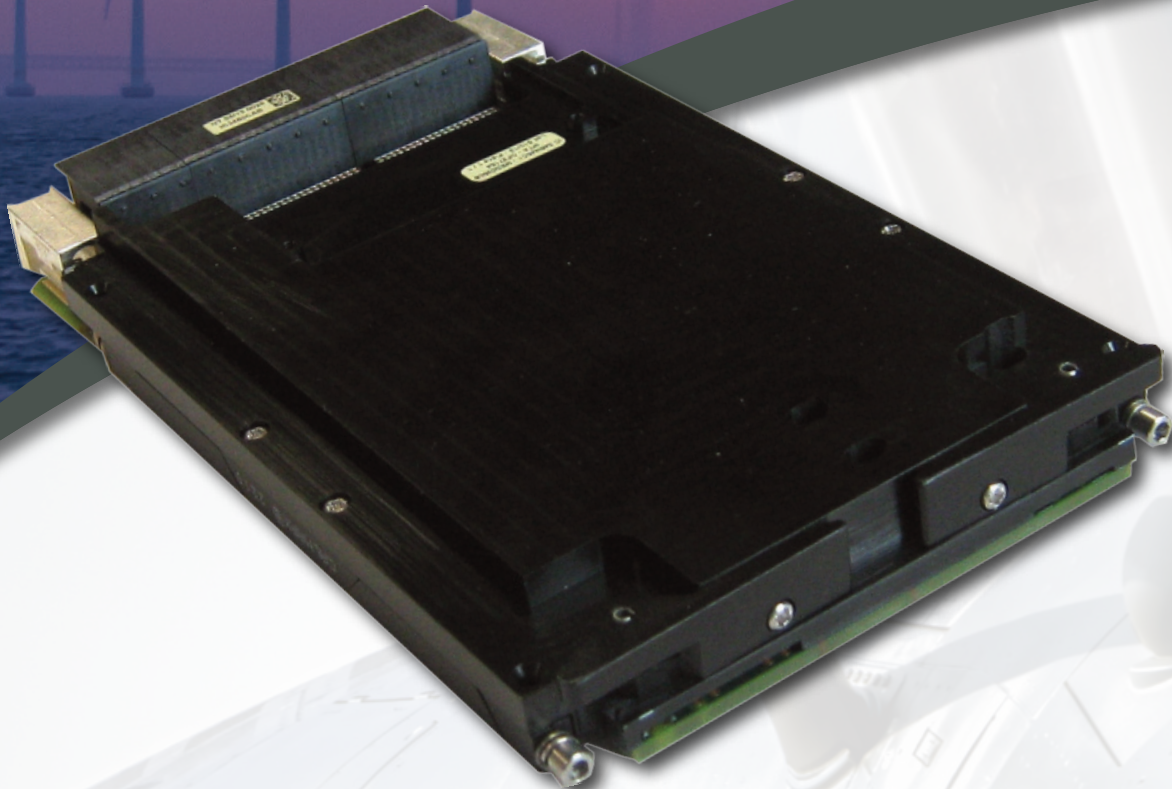
The full antenna range from PPM Systems can be found at:
<https://ppmsystems.com/antennas/>.

T: +44 (0) 1793 784389

E: sales@ppmsystems.com



New 3U VPX Intel® Xeon® W Single Board computer IC-INT-VPX3k



Interface Concept, a leading developer and manufacturer of high-performance embedded COTS boards and systems is introducing the IC-INT-VPX3k, a 3U VPX single board computer based on the 11th Gen Intel Core Xeon® W series (codename: Tiger Lake-H) processor.

The IC-INT-VPX3k provides the computing power and the media interfaces of a high-performance workstation on a 3U VPX form factor, while keeping power at a low level. It is

aimed at large bandwidth and high-demanding applications located at the edge of networks which may have to meet thermal and environmental constraints and have real-time functionality and operational safety mechanisms.

This 3U board-level product leverages the latest Intel 10nm Intel® Xeon® W series processor enhancements to provide high-computing performance and a complete set of high speed interfaces to system integrators with power, fast I/O needs and latest generation video interfaces. The IC-INT-VPX3k takes advantage of the Xeon® W eight cores running at 2,1GHz, 64G DDR4 at 3200MT/s and a large number of PCIe gen3 and Gen4 lanes ideal to connect peripherals with tremendous bandwidth. In addition, it supports the well-proven Intel® Advanced Vector Extensions 512 (AVX-512) instruction and the security protect modules of the Slim Bootloader.



“The IC-INT-VPX3k is the ideal solution for integrators who are looking for a new generation of SBC combining performance, high speed interfaces, managed power and featuring the latest Intel developments in video. This board will be well-suited for customers designing mission computers and surveillance systems” said Franck Lefèvre, Interface Concept’s Sales director.

Interface Concept provides Board Support Packages for Linux® (IC SDK, others...) and VxWorks®.

Other RTOS can be supported on request. Compliant with OpenVPX™ standard, the IC-INT-VPX3k is available in air-cooled and conduction cooled versions (compliant with VITA 47 classes). Interface Concept is now taking orders for the IC-INT-VPX3k which will ship in Q1-2022.

Main features

- Intel Xeon® W (Tiger Lake-H)
- DDR4 with ECC up to 64GB
- 1 Gen4 PCIe x4 (Data Plane)
- 1 Gen4 PCIe x16 (Expansion Plane)



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How Display Technology is being used in military applications for Night Vision Imaging

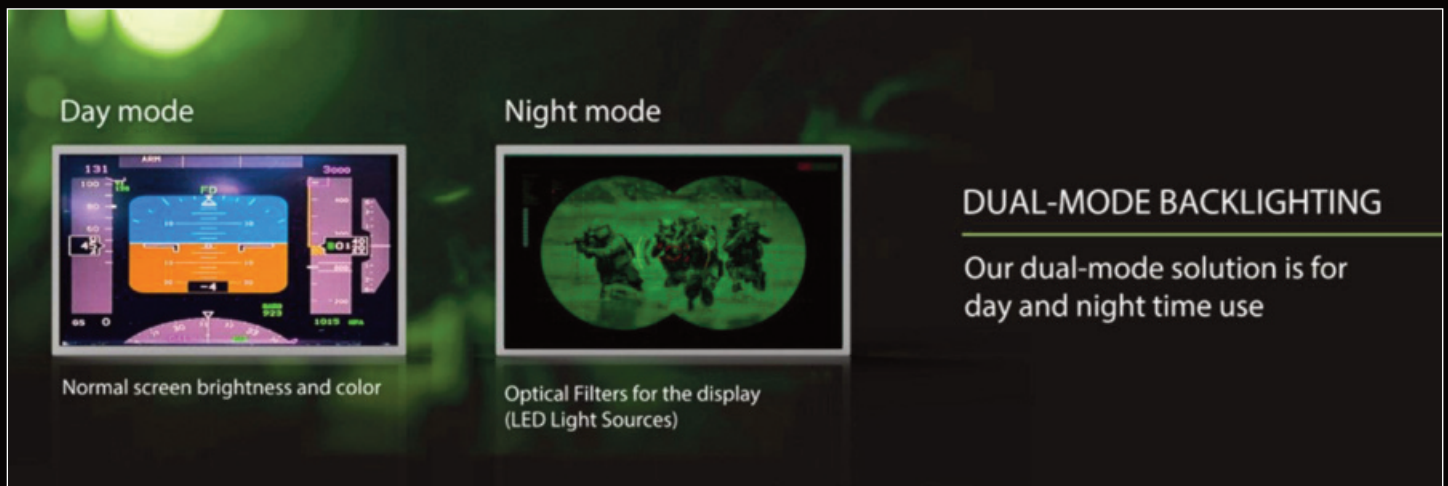
SECTOR 580-502

AREA:
 POSITION:
 ANGLE:
 STATUS:
 REC:
 TARKS:
 WARNING:
 CORE DAMAGE:
 RADIATION:
 SECTOR STATUS:

07/3
 25, 405, 11
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 TRACKING
 3
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 1233



In combat and use in other sectors like policing and civilian security, we've seen an explosion in demand for high performance Night Vision Imaging System (NVIS).



These handy display systems allow for enhanced visibility at night by emitting a small section of dim light that is easier to see at night.

Night Vision Imaging System displays make up part of Display Technology's vast catalogue of military standard displays and embedded systems.

The effectiveness of NVIS imagery is dependent on the quality of display used in the system, as poor displays can make it difficult to make out figures and images. That's where Display Technology's Taiwanese partner Litemax comes in, offering displays specifically designed for use in Night Vision Imaging.

Litemax's displays come equipped with a specialist NVIS cap filter on the LED backlight. This allows for easily configurable use between day mode (with 50% brightness off) and enhanced night mode. Litemax calls this feature 'dual-mode backlighting' – allowing for easy day and night mode use.

These displays for Night Vision Systems allow for covert and effective operation of display equipment at night. Military system designers use these displays for mobile radar stations or military vehicle operation. Standard displays can be too bright for use at night, negatively impacting covert operations. However, having displays that are designed exclusively for night use can make equipment unusable during the day.

The Litemax display's ability to switch from normal brightness in day mode to night mode using NVIS adds a lucrative level of versatility perfect for covert military deployment.

Other features of Litemax's stellar NVIS display is a wide operating temperature of 30°C - 70°C and its low power consumption. This makes the display perfect for prolonged outdoor use and can be powered by portable batteries for in-the-field use.

Who is Litemax?

Our partner providing these excellent displays for our military portfolio is Litemax. Founded in 2000, Litemax Electronics are a

display manufacturer from Taiwan, renown for their high-quality industry leading display technology.

First positioning themselves as a reputable supplier of sunlight readable industrial displays, Litemax has now established themselves as a trusted name for all of your display needs.

Alongside military-use displays like the NVIS systems, Litemax offers fantastic options for digital signage as well as excellent products for use in transportation and rail. These displays are specially designed to be ultra-efficient, be incredibly reliable and also adhere to all relevant standards for your market sector.

Why Display Technology?

Here at Display Technology, we have an in-depth knowledge of the displays we offer and can guide system integrators through the process of selecting the right products for their desired application.

For military applications, true compatibility and faultless reliability is essential. That's why military system integrations benefit from detailed advice on which displays fit the bill and hold the necessary safety regulations for combat use. We can help you pair displays with embedded systems and ensure the right power supply is selected for safety and EMC.

Get in touch with us today and explore how modern display technology can revolutionise your application.

www.displaytechnology.co.uk

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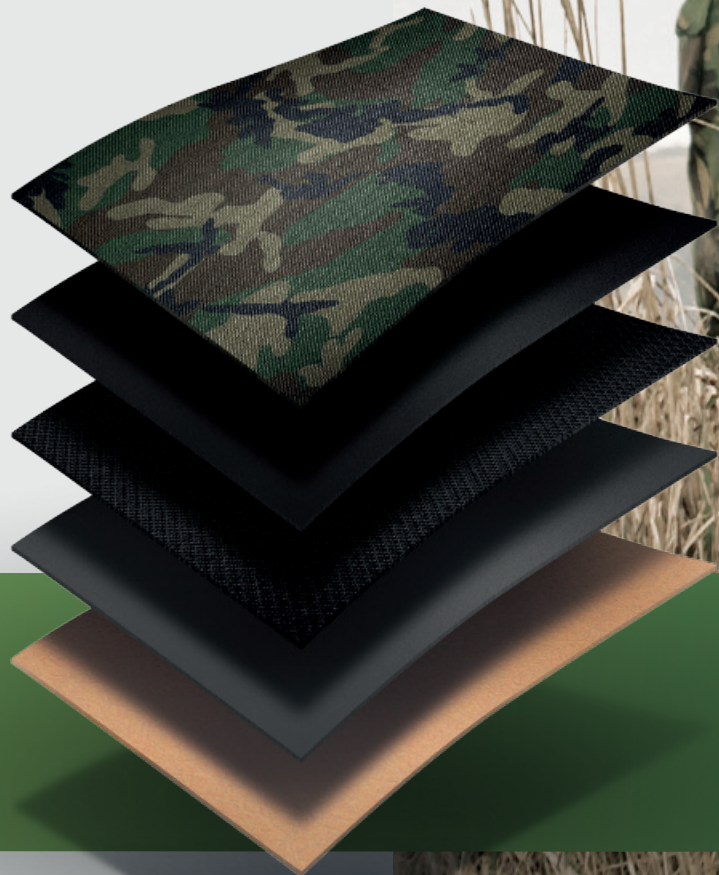
Flexzorb™ - The flexible, lightweight protective textile that is widely used by many of the world's leading defence vendors, making us the leading provider of activated carbon cloth for defence applications.

Lightweight and breathable, Flexzorb is used in a range of defence applications, including:

- CBRN Respirator filtration media
- CBRN Personal protective equipment (PPE)
- CBRN decontamination wipes
- Missile decoy media
- Phosphine gas adsorption media

WHEN FAILURE ISN'T AN OPTION

Chemviron, the European Operation of Calgon Carbon Corporation, has a long history of protecting and defending troops with our activated carbon products, and we remain committed to providing adsorbents to combat chemical warfare agents. In an environment where there is no room for failure, why wouldn't you rely on products that have been used and trusted for over half a century?







ADVENTURE
TACTICAL

25th
ANNIVERSARY

www.adventuretactical.com

This past year has been challenging for many across the globe. The pandemic has affected all aspects of life: reaching families, borders, the economy, and businesses both large and small.

Adventure Lights Inc. – a business located in Beaconsfield, Quebec, Canada – has been fortunate to have been able to weather much of the storm. The company has created state-of-the-art research and development facilities that allow us to both improve existing capabilities while developing new cutting-edge technologies.

The company has won numerous awards, including four consecutive Innovation Awards in Canada, a Congressional Award for Program delivery with NAVAIR and a Tech Connect Defence Innovation Award. With our direct inhouse manufacturing and research and development capabilities, Adventure Lights new innovations are now available in both our new and established product lines.

In 2018 Adventure Lights launched *Adventure Tactical Inc.* and brought its associated company Quantum Marine Ltd. to the forefront of the Search and Rescue industry with significant contract wins. As part of our steady growth initiative and expansion across product lines, these respective companies have become known industry standards in record time.

While adopting the *Extreme Products for Extreme Conditions®* slogan, Adventure Lights is now focused on supplying products to the Outdoor Sports and Recreation enthusiast, while Adventure Tactical Inc. focuses on distributing Positive Identification Solutions to those on the front lines. Adventure Tactical will also continue to supply Landing and Drop Zone Lighting Systems for deployment, evacuation, and supply in harsh environments. Quantum Marine Ltd.'s main focus continues to be that of serving the SAR community with a substantial focus on waterborne operations.

With the expansion of the Adventure Lights' umbrella, comes the introduction of one of the most sophisticated I.F.F. Helmet Lights on the market, *the Trilobyte™*, available exclusively through Adventure Tactical Inc.



The Trilobyte™ launched at IDEX2019, quickly gained rapid adoption, and set a new industry standard. It caught the eye of the Defense and Security community globally and set-in motion purchase orders that the company is rapidly fulfilling. During 2020, the Trilobyte™ became one of the most highly sought, and deployed, I.F.F. solutions in the world.

In a time where NATO countries and their allies are focusing on Future Soldier Systems and Programs, the Trilobyte™ was tested and immediately adopted in East Asia as part of their Soldier Enhancement Program and will continue to be used for the next five years. In some Scandinavian countries the Trilobyte™ has been purchased as a complement to our venerable VIP and VIPIR product. As many militaries are currently upgrading their technology with new vision systems the Trilobyte is being adopted to provide best in class features and capabilities for current and future soldier initiatives. While you are reading this, more countries continue to adopt our technologies to enhance the safety of their soldiers and law enforcement officers across the globe.

The Trilobyte™, with its unique lightweight design, delivers unparalleled performance compared to other products in its category. The light boosts features such as Auto-Synchronization, Programming and Playback, Early Laser Warning Systems, Multiple Colour Outputs as well as NIR and SWIR outputs. While some features are documented others remain unshared, except for use with some of the world's most exclusive and Elite Special Forces Teams.

The Adventure Lights group instills a culture of durability, dependability and innovation in its people and products that exceeds that of our competitors. This has been proven repetitively over our 25-year history. Our *VIP™* and *VIPIR™* products have become iconic with Special Forces and are still in active service after over two decades. This legendary product first hit the market in 1996, and like the Trilobyte™ today, the VIPIR™ became the standard for Special Forces.



The VIPIR™ continues to be unsurpassed in durability, versatility, and effectiveness in action – it remains the clear choice when compared to everything else in its category – and many Militaries continue to purchase this product built on the trust they have in its performance.

In 2020, Adventure Tactical, in collaboration with FinnProtec, was able to secure one of the most sought-after contracts published by the Finnish Ministry of Defence in recent years. The Minister of Defence authorised the Defence Forces Logistics Command to sign contracts for the procurement of weapon lights, helmet lights and Identification Friend or Foe beacons for soldiers. The procurement was preceded by extensive field tests conducted in Finland in which the suitability and compatibility of over 25 products were evaluated. These procurements were included in the national defence development programme and are part of the overall infantry night combat capability development. These procurements are aimed at building infantry troops' ability to fight at night, especially in poor visibility conditions. The I.F.F. Beacon chosen was our venerable VIPIR™. The first products will be delivered by the end of 2021 and taken into use starting from 2022. The overall value of this procurement is more than EUR1 million.

These are mere examples of the success that our group has been reaping, quietly (we are Canadian after all). As we celebrate our 25th anniversary, we also celebrate maintaining both our build quality and technology lead. From Personnel recovery and Identification Systems to Vehicle Identification & Safety Systems, and through our Expeditionary Landing and Drop Zones, the Adventure Lights group of companies offers a complete solution to many challenges.

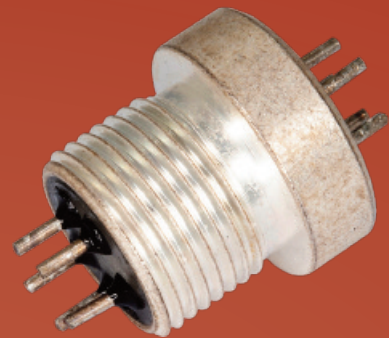
While we continue to deliver trailblazing technologies to enhance soldier safety, we also pride ourselves in being socially and environmentally responsible. We have recently added a Renewable Energy Man Portable Power System which helps reduce battery waste on the front lines as well as help the user maximize their power sources. This initiative directly reduces the quantities of batteries purchased, reduces waste, and saves hundreds of thousands of dollars.

On our 25th Anniversary, we are proud to be one of the oldest companies in our industry and want to thank all those who have trusted our brand, on the battlefield at home and abroad. Your enhanced safety is our continued goal whether it is at sea, in the air, or on land – When Success is Vital™ we are there to help provide solutions to successfully complete the mission.

Customised EMI Filter Solutions

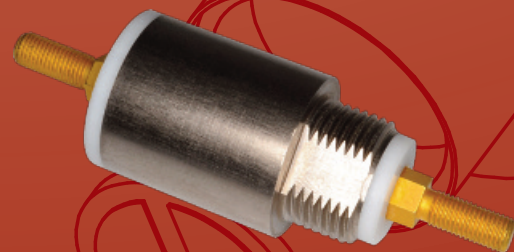
Oxley specialises in the design of customised EMI solutions for defence and aerospace requirements

- Harsh operating environments
- High performance
- Robust, compact and cost effective solutions



Oxley Solutions

- Discrete and multiline filters
- Threaded, solder, press fit and surface mount styles
- C, L, LC, CL, T, Pi, 2T and 2Pi variants
- Ceramic planar capacitor arrays
- Custom filter modules
- Arrays of discrete filters
- Filtering of MIL STD connectors
- Hermetic options available

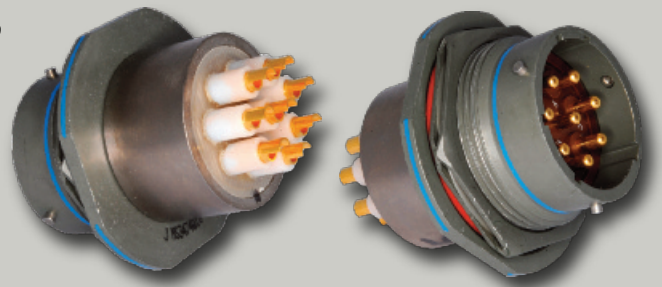


Oxley Capabilities

- Full in-house service from design to rapid prototype and manufacture
- Ceramic production capability for discoidal, tubular, and multiway planar array capacitors
- On site CNC machining, electro-plating, tool room and dedicated test area
- Rapid turnaround, integration and process control for uncompromising quality and reliability

Filtered Connector for a Land Vehicle

Following a specific customer requirement, a filtered connector for land vehicles was developed in-house at Oxley.



The three main requirements for the filter were high performance, cost efficiency and fast delivery at high volumes.

The performance required was beyond the limit of discoidal technology so required a planar solution. Oxley has an inhouse ceramic planar manufacturing department with a team of 15 staff, this enabled Oxley to design, manufacture and deliver the project quickly and continue to supply these parts throughout the life cycle of the project.

Due to the application, it was critical that the filtering was shock resistant and had high noise attenuation, so planar technology in a low density planform was the solution used. The ceramics were compliantly mounted allowing them to survive high shock vibration levels. Although the filter is small, it had 1400nF of performance.

Using a MIL connector and Oxley's exceptional in-house ceramic design and manufacturing capabilities enabled the team to meet the customer's requirements and deliver a cost effective and fast turnaround solution.

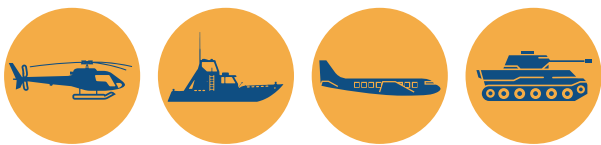
www.oxleygroup.com



Image – iStock.com-Rockfinder

PARAMOUNT PANELS

ILLUMINATED INFORMATION PANELS



Paramount Panels UK is a specialised lighting company, with 50 years experience in the aerospace and defence industry.

OPERATIONAL INTEGRITY

www.paramount-panels.co.uk



With over 50 years continuance experience in the design and manufacture of lighting components and edge-lit panels, Paramount Panels is a world class leading supplier to the aerospace and defence industries.

Aircraft Control Panels, Illuminated Control Panels and Integrally Illuminated Light Plates

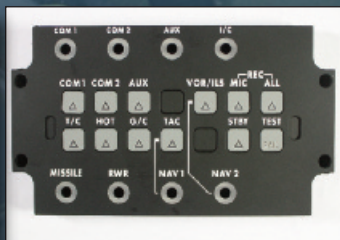
We specialise in new applications and in support of our customers, offer

a free technical consultancy service from concept design and prototypes to the manufacture of production quantities. Flexibility is a key feature of our organisation and, as a result, we are able to produce prototypes, small batches as low as a one off, and larger quantities at very competitive prices. A further service we are able to offer is the design and manufacture of sub-assemblies which, typically, comprise the lightplate together with its' associated components such as rotary and toggle switches, potentiometers, displays, control knobs and electronic interfaces systems. Where appropriate EMC screening can also be incorporated if required.

Our modern manufacturing and processing facilities include cad/cam modelling, laser engraving and screen-printing, photo-etching and off-set printing. Computerised light balancing and a comprehensive range of photometric devices ensures that compliance with the most demanding specifications.

PPUK technology covers all of the integrally lit panel systems currently employed in military and civil applications and offers a wide choice of light sources including Incandescent, LED and electroluminescent plates. All of our products can be supplied for compliance to the exacting demands for night vision, NVIS and NVG applications.

The main base line specification covering this type of product is MIL-DTL-7788 (formerly MIL-P-7788) and we offer a full range of products



to cover, typically type III, IV, V, V1 and VII and classifications classes from 1-R to class 1-NVIS.

In many applications integral annunciators are required within our panels, this technology we have become experts in, and we supply secret until lit annunciators, that are sun light readable meeting the requirements of MIL-S-22885. Our technology in this field is second to none, with custom processing techniques that produce a totally flat integration.

Our quality procedures are governed by an extensive range of approvals that include:

BS EN ISO 9001:2015 and CAA Part 21, Subgroup G.

NVIS and Night Vision Lighting, Post Lights, Instrument Lighting Bridges, Pillar Lamps and Lighting Bezels

PPUK is a global leader in the field of NVG compatible lighting and designs and manufactures a range of products, which cover all aspects of this application. These include edge lit control panels (lightplates), Keyboards, Post or Pillar lamps, instrument bezels, switch bezels, cockpit utility lights and general lighting components.

In-house computerised radiospectrometers and light balancing equipment ensures that this range of products is fully compliant with the requirements of the military standard (MIL-STD-3009 & MIL-L-85762) that covers NVIS applications.

NVIS and NVG Compatible, Illuminated Panels, Avionic Panels and Aircraft Key Bezels

With our extremely long relationship with the aerospace industry PPUK have gained the position of being a world leader and a specialist in NVIS lighting applications, and we offer a comprehensive service for night vision compatible illuminated edge lit control panels and assemblies.

Our engineers are always contactable for free advise, and we are well known through industry for our excellent customer service.

Another option and service we offer is the ability to convert standard illuminated panels to a NVIS lighting standard, and if required incorporate indicia changes and refurbish the original panel to a new look standard.

Keyboard Switch Panel and Illuminated Keyboards

Our designs within this product sector have been proven in many demanding environments and include aerospace, marine and fighting vehicle applications where our technology has met and frequently exceeded our customer's expectations.

Keyboard designs are normally required to be backlit and often specify



the inclusion of integral annunciators; where necessary these can be "sun-light readable" and "secret-until-lit". Any of the lighting systems specified in MIL-DTL-7788 is available for the illumination of keys, panel text and annunciators and, if required, a mixture of light sources can be incorporated in a single design. For example, incandescent filament lamps and light emitting diodes. We also offer the ability to allow for similar dimming characteristics between LED and incandescent lighting sources within the panel assembly.

The relatively simplicity of our designs ensures a high degree of reliability and offers a variety of switch actions and key options. In most cases, the comprehensive range of injection moulded key caps that we have already tooled will satisfy most requirements and thus a fast low cost turn-round. We can work from our customers finalised drawings and specifications or, alternatively, we are pleased to make available engineering expertise and advise in order to develop the best solution to satisfy the requirement.

Annunciator and Indicator Display Panels

One of our recent technical innovations has been the introduction of "sun-light readable secret until-lit annunciators completely housed within the thickness of the lightplate. This system contributes to a totally flush front panel surface and in the un-illuminated condition, the annunciators can be rendered indistinguishable from the surrounding area. Among other applications, this unique integrated flat face panel technology is ideally suited to Advisory displays. Employing appropriate lighting sources and filters, a range of chromaticity requirements, including NVIS as specified in MIL-STD-3009 can be achieved. The construction of our annunciator and indicator display panels is generally based on the mechanical and environmental requirements detailed in AS 7788.

Transilluminated Control Knobs

Although Primarily a manufacture, Paramount Panels (UK) are the strategic partner and distributor for electronic hardware Corporation (EHC Knobs) probably the world's largest manufacture of control knobs. Thus, we are able to offer an extremely comprehensive range of knobs many of which are held in stock. In other instances, we are always willing to acquire any necessary stocks and to deliver these in accordance with our customer's schedule. The EHC ranges of control knobs complement the "DEF-STAN" range of knobs that we have manufactured for many years and which remain readily available. In the event that a requirement for a non standard control knob arises, the combined expertise of EHC and Paramount Panels will ensure a solution at low cost.




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Cummins doesn't just power your defense, they enhance it. As a leader in integrated defense systems, Cummins offers trusted technology to ensure elite reliability and rugged durability. No system too small, no machine too large — Cummins defense technology powers everything from mobile generators to heavy artillery. Our expertise and product innovation can tailor powerful solutions for any obstacle. Regardless of your defense needs, Cummins has the technology to keep you running strong in a world that's Always On.

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Avon Protection is at the forefront of supplying integrated Chemical, Biological, Radiological and Nuclear (CBRN) solutions to military and law enforcement forces worldwide.

An interview with Justin Hine, Project Director CBRN (Military) from leading CBRN protection company Avon Protection.



How did Avon Protection become involved in the CBRN market?

We have been supplying respiratory protective equipment to military forces, civil defence and emergency services for over 100 years. We have been supplying protection solutions to the UK Ministry of Defence and other allies since the First World War and are a primary supplier of integrated protective equipment to NATO and the United States Department of Defense. With over 3.5 million respirators in service, users in over 65 countries all put their trust in Avon Protection's technology to shield them from whatever threat.

What current CBRN threats do troops in operation have to be aware of?

The use of chemical weapons by state actors and terrorists in the last



decade has clearly demonstrated that the nature of threats to international security has changed significantly. Most militaries now recognize the change in CBW threats and are in a process of reinvesting in appropriate CBRN defence capabilities. At Avon Protection we are continuously assessing the threat and working with our customers worldwide to ensure we design, develop and deliver world leading capabilities to meet their specific requirements.

What CBRN solutions do Avon Protection offer to the market?

Avon Protection offer a broad portfolio of CBRN products. Our market leading CBRN solutions include a range of respirators, filters, Powered Air systems, Self-Contained Breathing Apparatus (SCBA) and communication, hydration and vision accessories.

Core to our CBRN protection solutions is the 50 series range of respirators. Developed in conjunction with the United States Department of Defense to counter the multiple CBRN threats met in modern war fighting, anti-terrorist and peace-keeping operations. The 50 series respirators are the most operationally proven and widely deployed battlefield respirators in the world.

How important is Research & Development to Avon Protection?

At Avon Protection we continue to utilize our technical and materials expertise to remain at the forefront of innovative technology and produce specialist products and services to maximize the performance and capabilities of our customers. We maintain our links to key universities across the world and continue to work with new and existing customers and suppliers to develop our knowledge and product range

In 2020, we invested a total of £9.0m (2019: £7.3m), representing 5.4% of revenue (2019: 5.7%), in research and development. We expect to continue to invest at this level over the medium-term, reflecting our confidence in our expanded research and development capability to innovate across our broader personal protection portfolio to meet more of the integrated future technical needs of our customers for the benefit of further revenue and profit growth.

Other than the obvious demand for “lightweight” and “increased protection factor”, what else is driving requirements?

We are an innovator of respiratory and ballistic protection products

and systems for a variety of customers across NATO and their allied countries. As a global leader in soldier protection technologies, we will continue to invest in the design and delivery of integrated soldier systems.

Avon Protection recognise the need for all individual pieces of equipment to interface together to ensure the complete soldier system provides maximum performance and protection. Integration is at the core of our future CBRN capability which includes our market leading respirators: alongside helmets, boots, and gloves. Our products are developed to integrate seamlessly with ancillary equipment such as the respirator, helmet and other head systems. This approach to integration between soldier equipment provides militaries with the highest level of performance and protection whilst still maintaining operational agility.

www.avon-protection.com

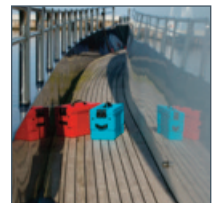
AVON
PROTECTION

WHAT NOW ?

Following the granting of the safety certificate by the Health and Safety Executive certifying the PlastPack Defence (PPD) Light Weight Ammunition Case (LWAC) as fit to store and transport ammunition PPD is setting out further down its development and commercial paths. Pole position on the grid is to finish development of the PA120LWAC®.

This development is being undertaken in co-operation with Rheinmetall Waffe Munition GmbH for insensitive munitions. The new LWAC® will bring the same weight, environmental, reduced transportation costs and operational benefits as the L2A1 LWAC®. The whole point of the move to plastic cases is the reduction in weight achieved for a packed ammunition load. For the PA120 the savings from using PA120LWAC® compared to steel cases is roughly 2/3. Because of the improvements that can be made by using injection moulded plastic the LWAC® allows better and safer stacking enabling easier loading and better space optimisation in platforms. The reduced weight also provides other operational benefits, greater platform range, quieter operational resupply in close proximity to the enemy and carriage of more ammunition on the same logistic platform providing even more environmental benefits with less journeys and more efficient use of transport assets and dare it be whispered fewer transport assets and their supporting infrastructure.

Like the L2A1 the PA120LWAC® can come in a range of colours





to enable easy identification of different ammunition nature stacks. This is not a Henry Ford moment but a very effective time saving and accounting aid. Coupled with this embedding RFID tags in the case from manufacture enables complete tracking and accounting in a very much more efficient way that the classic man with a clipboard.

A new and very different use for LWAC® is using it to protect valuable stores against inclement weather and damage including being soaked and damaged. The range of goods being kept safe includes clothes, rations (also rodent proof!) high value electronics radios etc and electronic components. Already in use in this role by the UK's Royal Marines and the Danish Armed Forces this innovation has allowed operations and expeditions to be mounted which might not have been undertaken otherwise because reserves of additional equipment are kept safe and dry and this reduces the amount of extra equipment required to be carried.

The phrase “no coffee no war” is a well known military joke. LWAC® helps because there are fully NATO stock numbered

coffee sets in LWAC® packaging ranging in content from lots of more basic servings to fewer more upmarket offerings. These simple things allow the matches to be kept dry to light fires and dry socks to be put on sodden feet when they are needed. It all helps the Army to March on its Stomach.

In the civilian world users of LWAC® include Kayakers, yatchmen, sporting shots and hunters, fishermen and agricultural workers to name but a few. Similarly companies wanting to transport delicate electronic components or precision items in a fully protected light weight container. In short the more people see of LWAC® the more uses they find for it.

www.ppddk.dk



PlastPackDefence

Streamlining Software Development with Certifiable Code Generation

Model-based engineering for critical systems

Ensuring safety-critical software is developed and certified on time and within budgets is vital to the overall success of military and aerospace projects. Yet the increasing complexity of these systems risks missed deadlines and cost overruns.

Automating code generation can dramatically speed up the development process. However, up until now, certification concerns added major overheads in terms of both time and resources. Our latest whitepaper explains how a new approach can streamline code development and meet the highest levels of avionics certification across all of your projects.

Working with the aerospace industry, AdaCore has developed QGen, a model-based engineering toolsuite with a qualifiable code generator for the dominant Simulink® and Stateflow® modeling languages.

AdaCore is currently in the process of qualifying the QGen code generator at the TQL-1 level. This will streamline the model-based certification process (under DO-178C and its DO-331 supplement) for users creating safety-critical systems using the tool, unlocking the benefits of code generation while ensuring that certification needs are met. Built from the ground up to be qualifiable and productive, QGen has a full suite of model-based engineering tools that

can expedite the certification/testing process (including testing tools and a model level debugger), providing everything required in a single package

Essentially, QGen is designed to combine the benefits of automatic code generation with more straightforward certification, with a solution developed specifically for the needs of large aerospace and defense organizations running multiple, simultaneous projects. This means that customers who want to take a model-based approach to development can now dramatically reduce verification activities on the generated code, lowering costs while streamlining the overall certification process.

Collins Aerospace has selected QGen, and the TQL-1 Enterprise Qualification Package, to advance the development of its FAA-certifiable Perigon™ computer, which is designed to support the future flight control and vehicle management needs of commercial and military rotary/fixed wing platforms. By using the TQL-1 release of QGen, Perigon™ software developers are able to save thousands of hours of testing, verification, and certification efforts, while providing additional safety guarantees to their customers. With the adoption of the QGen Enterprise Qualification Package, Collins is now able to streamline its model-based engineering practices.

Download our latest whitepaper at adacore.com/code-generation to discover how model-based engineering can streamline your software development processes.



AdaCore

QGEN

The Code Generator and Model Analysis Tools You Can Trust

QGen is the first **TQL-1** qualifiable and tunable code generation and model analysis toolset for a safe subset of Simulink® and Stateflow® models. It saves time and money during development and verification of safety-critical avionics control and display applications.

Find out what QGen can do for you!

Visit adacore.com/QGen or contact sales@adacore.com

AdaCore

High-power electrical connectors for the future



In recent years, we are seeing a rapid increase in the rate of electrification in industry, with fossil fuels being phased out in favour of more environmentally friendly power options.

As a result of this trend, there is growing demand for high-power electrical connector solutions that offer high performance, even in harsh operating environments. Here Shaun Findley, European Director of Product and Purchasing at electrical connector specialist PEI-Genesis, discusses some of the key areas of demand and the high-power connector solutions available for these applications.

To tackle climate change, Nationally Determined Contribution objectives have advised that the global demand for electricity will increase by 80 to 90 per cent by 2050. These objectives resulted

from the Paris Agreement in 2015, an agreement made at the 2015 United Nations Climate Change Conference, which aimed to reduce greenhouse gas emissions and adapt to the impacts of climate change.

Renewable energy sources could produce more than half of the world's electricity by 2035 and do so at a fraction of the cost of fossil fuel, according to reports from McKinsey & Company.

As the world continues to push for greener energy sources, industry is adjusting how it sources its energy. For example, there is a strong push among electrical interconnect manufacturers to gain market share in a race to increase the power distribution capability of connectors. Electrification impacts many markets across the interconnect industry, such as the military and industrial sectors.

Electrification and the Military Market

The global military vehicle electrification market size and share revenue are expected to grow from \$4.8bn in 2020 to \$8.6bn by 2025 at a 13 per cent annual compound annual growth rate from 2021-2026, according to a market research report by Facts and Factors.





This growth has been attributed to both demand for new technologies and a push to go green. Countries worldwide are beginning to invest in electric military vehicle research to improve the stealth, speed and power of vehicles, and many are noticing that autonomous and semi-autonomous vehicles — which depend heavily on electrification — reduce human loss on the battlefield. Furthermore, countries can leverage electrification to reduce military spending by investing in longer-lasting, environmentally friendly energy sources. The European region is expected to lead in the military EV market because of its strict emissions regulations.

Electrification and the Industrial Market

The Environmental Protection Agency reports that roughly 23 per cent of greenhouse gas emissions in the United States come from the industrial sector. It is estimated that electrification can replace almost 50 per cent of the fuel sources used by industrial companies, according to McKinsey & Company. However, this level of electrification requires rugged, dependable high-power industrial connectors.

The Amphenol ecomate® RM series of circular, metal connectors are ideal for electrification across military and industrial applications.

These circular connectors have an IP67 rating when mated, and a maximum current rating of 300A. They are available in both standard and high amperage versions and are equipped with a user-friendly bayonet coupling system.

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For over 60 years, Greenray quartz crystal oscillators have served as high reliability reference sources for industrial and military applications that require low g-Sensitivity and excellent phase noise in order to optimize system performance while operating under the most demanding environmental conditions.

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Leveraging our extensive design and manufacturing experience, Greenray space-qualified TCXOs have been designed specifically for LEO (low orbit) satellite applications and/or deep space exploration. They offer guaranteed, long-term performance under radiation exposure from 30krad to 200krad.



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When The Going Gets Tough...

Radar, SATCOM, airborne communications, GPS, telemetry – these and other military systems rely heavily on high performance crystal oscillators to optimize system performance under the most demanding operating conditions.

Oscillators function as the heartbeat of these systems, generating the frequency – the timing reference signal – they require to function effectively. They are designed to perform precisely and reliably under any and all conditions that the system may encounter. Noise in the system – *phase noise* – and sensitivity to shock and vibration, or *g-Sensitivity*, are the critical performance parameters that must be addressed.

Data communications systems used in military applications often require that the signal be multiplied to a higher frequency. And because noise degrades exponentially, it is necessary to start with as little phase noise as possible.

The presence of high phase noise in the oscillator of a receiver, for example, will limit the sensitivity required to detect very low power signals, such as weak signal returns from a distant target.

While an ideal oscillator would generate a pure, noise-free sine wave, all oscillators produce noise due to active devices in the circuit. Fortunately, design, manufacturing and test advancements in recent decades have enabled crystal oscillator phase noise performance previously thought to be impossible.

While crystal oscillators provide today's system designers with frequency reference sources that can offer exceptional phase noise and frequency stability performance, one aspect that may not be considered initially is the signal degradation that can occur when the oscillator is exposed to vibration in the application environment. Even moderate levels of vibration can adversely affect a low noise signal – and increase phase noise.

Although it is not possible to completely eliminate the effects of acceleration on the frequency of a quartz crystal oscillator, by understanding the vector nature of the crystal's g-sensitivity characteristic, the impact in most applications can be minimized and managed acceptably.

For a more thorough technical discussion of the g-Sensitivity characteristics of oscillators and the implications for defense and airborne system platforms, please visit the Tech Articles page at www.greenrayindustries.com and download "Sensitivity Characteristics of Crystal Oscillators."



WHAT DOES DSEI MEAN FOR A CONSULTING COMPANY

DSEi is probably the major Defence and Security exhibition in Europe and arguably North America as well. It has been running for 30 years, others have been running for longer but DSEi has always seemed to have more impact.

Until almost the Eleventh hour this year there was doubt caused by the COVID pandemic as to whether it was going to go ahead. A credit therefore to Clarion Exhibitions that once it was decided to go ahead contingency plans were activated and things went as quickly and smoothly as they did. The consensus was that it was different but nevertheless very successful and in many ways better for being different. Of course there were niggles and things that could have been improved on, entry procedures being but one, but on the whole BRAVO.

What does a consulting company seek to get out of an exhibition or any gathering of the defence clan? In no order of priority the three most important are: people, helping clients and taking the temperature of defence (and security both big and small i.e. national and local) In addition there are other issues such as what are the corporate machinations going on? Where have the programmes one has not been able to give as much attention as one would have liked got to during the time since the last pan defence get together? Taking a quizzical look at equipment that has been purchased and wondering why, or why in that format?

First and always first people, as a consultant they are the

sea you swim in and your life blood. After all your clients are going to be those people. Part of it is catching up on the gossip, part of it seeing who has moved jobs and roles and who is doing what, where and are they progressing and part of it is just remaking old contacts given the restructuring of MOD and the defence industry. Overarching all of this is the need to understand what individual's viewpoints are and what they believe in be it technical or philosophical issues. When you need to know something you need to know who to discuss it with.

If people are the life blood understanding defence issues and philosophy, corporate positioning and philosophy and team dynamics are the rocks which channel the flow of water and the ability to swim in the sea. Too often people set out to solve a problem with no concept of the context into which it fits. A fish can be a brilliant swimmer but unless it is swimming where there is food it rapidly gets hungry and weaker and gets eaten.

DSEi enabled Lutra to help a number of our clients. Obviously this help had to be tailored to the market position of the client. Equally many people forget that a consultant is just as much doing their job when asked to give advice and that

advice is not to proceed with a course of action even though this might not be in the consultant's financial interest.

Thus one client came to DSEi intent on taking on a role and position in a medical area and exploring the options available to them. Three factors influenced the advice Lutra provided: the size and nature of that segment of the market, the size and nature of the company and the fit between the company's and the market's cultures. A short discussion with people already in the market, which is very crowded and with potential users and purchasers quickly convinced the company it would have been a fish out of water and little would be achieved by a dip in the sea. A few face to face discussions and briefings quickly achieved a decision which would have needed a lot of paper, discussion and modelling to reach the same conclusion. A role few would have considered for a defence exhibition.

In a similar vein a second client wanted to join a particular, different, segment and arranging similar face to face discussions armed this company with the necessary data to have a reasoned discussion when they get back to their office. They decided to take a step into the market. Two almost identical activities but with different outcomes.

Helping a third company new to DSEi make the most of its attendance at DSEi involved bringing Lutra's and it's associates experience to bear to make the most of the opportunities DSEi presented to interact with users, scientists and equipment specifiers at the exhibition. At the same time Lutra helped the company's own team to get targeted invitations to the people potentially interested in their capabilities. This is not a trivial activity. We have all been swamped by uninvited general invitations to visit stands at major defence events that seem to have no purpose. Generating a reason to meet and common interest is really important.

A fourth helping hand was for a company that is changing perceptions of what training is all about. Part of Lutra's role was to help launch a press conference make certain there were sufficient hosts when there were lots of visitors. Their success in breaking the training mould generates this sort of interest. Smaller companies, not this one because they had contingencies to deal with the issue, often have difficulty when dealing with unscheduled or senior visits but they should be welcomed. If people want to see you that has to be good. Making the best of it is important. Lutra was pleased to help out as part of the contingency plan.

A good consultant will represent his clients even if they are not present and not paying for his time and effort. Two of

Lutra's clients were unable to attend DSEi, mainly due to the short notice involved with the decision to go ahead. However being able to fix meetings with key customers to touch base and refresh relationships and exchange news is never wasted effort. Luckily one of the client's products easily fitted into a small day sack and the other's was easily shown using a tablet. Arranging meetings with potentially interested parties requires a bit of co-ordination. A coffee does the rest.

And the stock take on defence? Firstly all concerned were glad to get back to seeing people in person rather than as 3 inch montages in a 21 inch cube. There is a growing realization that the large defence primes are perhaps having to fight harder for orders because the SMEs are snapping at their heels. However there is potential to really turn this around.

If the government goes ahead with it's potentially ground breaking Transformation of Public Procurement programme and rids DE&S of the totally risk averse culture and financial bureaucracy imposed on it by the Treasury then all bets are off. The primes will have to reduce their bureaucracy, mark you so will DE&S, and may be even the Treasury, and then prices can really be reduced, equipment brought into service more in line with the shortened operational life cycle and tempo of modern warfare and wider defence. However this is a big ask for the government and will be a bold step but it's probably a major part of growing back better. It overturns decades of ingrained inefficiency but then the Public Accounts Committee has just delivered another withering attack on the whole defence procurement edifice (MoD defence equipment systems "broken and repeatedly wasting billions of taxpayers' money") so may be the time is right. Perhaps better to have a few failures than persistent waste due to programme overruns and delays.

In short DSEi showed just what a consultant needs to do and what can be gained from a good exhibition. Similarly the diversity of potential tasks became apparent. Welcome back and long may you continue.



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Here at Trifibre,

We are committed to ensuring the absolute best quality service and products whilst delivering in a timely manor. Here are just a few of our business aims and ethics to show that not only are we an ambitious company, but we do everything to keep our carbon footprint low.



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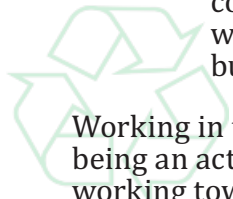
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THE IMPORTANCE OF SUSTAINABILITY IN A BUSINESS



Sustainability is a massive trend that businesses need to make more of a continuous effort to focus on. Sustainability goals are a good way of doing this - laying out what is achievable and matching that with encouraging end results to build into your business strategy as motivating factors of achieving them.

Working in the manufacturing industry comes with its challenges when setting the focus areas for being an actively sustainable business. However big or small, all goals are part of a robust strategy working towards sustaining our planet and its resources. At CP Cases, we have contributed significantly (especially in the past year) to becoming a more sustainable manufacturer. Keep reading to find out what steps we have taken.

THE IMPORTANCE OF SUSTAINABILITY

Sustainability has been a predominant trend over the last couple of years and we feel it is going to become even more prevalent. This focused importance is crossing over into different industries more and more with the message that we are the first generation to see the our effects on the planet but the last generation that can really do something about it. Whether individually or through your business, there is an increased awareness on activities that will impact the planet.

Sustainability is becoming more of a focal point for companies across all industries with 62% of directors taking into consideration a 'sustainability strategy' needed to be competitive in today's markets. Another 22% predict this type of planning will be the future.

With this in mind, we took the entrepreneurial step to hold our own rotational moulding machine in-house for the manufacture of our range of Amazon Cases and Amazon Racks.

RECYCLING

Rotational Moulding is a manufacturing process used widely in the automotive industry to produce weight efficient, immensely durable and recyclable plastic containers and is an integral part of CP Cases flagship product line, Amazon Cases and Racks.

Although there are many thermoplastics available the most commonly used for rotational moulding is polyethylene. This is because it has good processing characteristics, is relatively inexpensive and has satisfactory engineering performance combined with resistance to environmental conditions. It can be coloured for corporate requirements (even mottled!) and to improve UV resistance. The polyethylene we use biodegrades naturally, albeit over a long period of time. Methods are available to make it more degradable under certain conditions.

Our London HQ is home to our brand-new Rotational Moulding plant which enables us to increase capacity and reduce manufacturing waste, our Amazon Cases & Racks are 100% recyclable. Manufacturers often create high volumes of multiple manufacturing waste materials in fast moving environments. We endeavour to recycle most of our used materials including aluminium, polyethylene, general waste, plywood and more.

Most companies will share the same sustainability goal of reducing their carbon footprint in any way they can. Over the years we have been working hard to bring the majority of our production and manufacturing in-house. We are also in the planning stages of installing solar panels on the roof of the factory for a greener and more sustainable power source for our office space and machinery. Small steps definitely can make the biggest difference and we as a company are supporting this as much as we can.

SPEAK TO OUR TEAM ABOUT OUR RANGE OF PRODUCTS

We are honoured to be building on our foundation to create the company's next phase of growth and evolution, keeping up with the changing environments and working towards a more sustainable way of working. Here is to the next 50!



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Rotational Moulding is a manufacturing process used widely in the automotive industry to produce weight efficient, immensely durable and recyclable plastic containers and is an integral part of CP Cases flagship product line, Amazon Cases and Racks.

Our London HQ is home to our brand-new Rotational Moulding plant which enables us to increase capacity and reduce manufacturing waste, our Amazon Cases & Racks are 100% recyclable.

CP Cases has an extensive track record in designing and manufacturing for highly customised requirements. Please contact us to discuss how we can help you find your ideal transport or storage solution.



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Bath, 15th November 2021 – Horstman Group, a company of the RENK Group, is delighted to announce that it has won a new multi-million pound refurbishment and upgrade contract.



Horstman

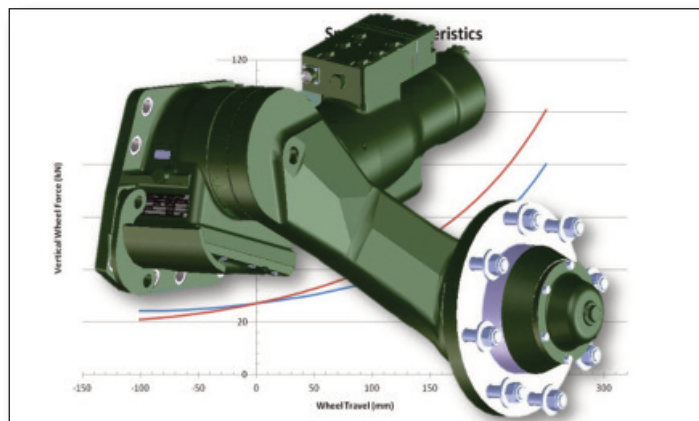


Challenger 3 (photo taken at DSEI 2021)

Horstman has been awarded a new contract from the UK Ministry of Defence (MOD) for the refurbishment and upgrade of Hydrogas® to a 3rd generation suspension unit for main battle tank, recovery and engineering variants as part of the Heavy Armour Automotive Improvement Programme (HAAIP). Feeding into the new Challenger 3 Main Battle Tank, this award follows many years of production and support to the British Army's armour fleet including Warrior, AS90, Terrier and the design of the original Challenger Hydrogas®.

This multi-million pound contract maintains our long heritage of providing combat mobility solutions in support of the British Army and clearly demonstrates our excellent relationship and proven quality as a global supplier.

Horstman are proud of our decades' long relationship in support of the Challenger fleet of vehicles and as part of the RENK Group we look forward to supporting the UK MOD into the future.



“This was a very competitive contract to win and we are excited that we were able to secure it.” says Ian Pain, CEO Horstman Group. ***“This is testament to the engineering, project and delivery teams who have worked hard through difficult times to prove the HAAIP concept and win this new work.”***

Steve Pursey, Integrated Technical Services team lead said, ***“Great news for the team as we have worked hard for many years supporting the British Army and the development of this latest generation suspension upgrade for Challenger.”***

About Horstman

Horstman – a company of the RENK Group – has been headquartered in Bath since 1913, with business units in the UK, the US and Canada. It delivers mobility solutions for the global wheeled and armoured markets' hardest challenges. Horstman provides world leading design and manufacturing capabilities, with our customers benefiting from our time-tested pedigree in innovation, product development, manufacture and defence project management in heavy armoured and tracked vehicle suspension systems.

Horstman designed and manufactured products have been integrated for many years throughout multiple, battle proven, British Army platforms and for customers globally. For more information, please visit: www.horstmangroup.com

About RENK

Headquartered in Augsburg, Germany, RENK Group is a globally leading manufacturer of high-quality transmissions, engines, hybrid drive systems, suspension systems, slide bearings, couplings and test systems. The group serves a wide range of end-markets with a particular focus on armoured vehicles, defence and civil marine, power generation, plastics, oil & gas, and others. With over 3,000 employees, RENK Group generates annual revenues of over EUR 800 million. For more information, please visit: www.renk-group.com

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A TRUE ICON

The Toyota Land Cruiser is a true icon. For private use as well as for security purposes.

In the Civilian Armoured Vehicles (CAV) market, the Land Cruiser has evolved into an industry standard. With the launch of the Toyota Land Cruiser 300 (LC300) the market is scrambling to get the first vehicles, designed, built and delivered. Tenders for CAVs will be re-evaluated, as many are being fulfilled with the now discontinued Land Cruiser 200. Some of these contracts will require deliveries beyond the availability of the "200", while the armouring packages of the LC300 are still being designed and certified by the various converters on the market.

One thing will remain the same for the LC300: TSS International is still your partner for Armour Mobility! Through close collaboration with our customers and suppliers, our goal is as always to deliver a tailored package of mobility products, designed for strength, reliability and synergy.

In fact, the design for the wheel has been already finalised. As soon as the up-armoured vehicles need them we will be ready to



deliver a complete, heavy-duty runflat-wheel-assembly, just like we have done over the last 10+ years for the highly successful Land Cruiser 200. The new wheel will offer a stable basis for the increased weight and changed vehicle characteristics and provide assurance to get to safety in case of an emergency.

The combination of the TSS Heavy Duty Wheel AR877HR, Rodgard BPX Runflat Insert and the high payload tyre of your choice (e.g. Maxxis JRZ Bravo 275/70R18 128Q) will continue to be the number one choice for armourers who seek unparalleled reliability and quality in the foundation of their armoured vehicle.

Other products Armour Mobility products for to consider for armoured conversions of the Land Cruiser 300:

- **TSS ProtecTank®:** the only true self-sealing fuel tank technology on the market, providing a unique combination of made-to-measure protection and weight-savings.
- **MOV'IT Security:** Heavy Duty Brakes, tailored to the increased weight and changed weight distribution. Consistent braking power!

- **SKYDEX shock mitigation products:** protecting feet and lower legs against the destructive force of the fast-moving armoured floor after IED-blast under an armoured vehicle.
- **B&G Intercom Systems:** Discretely installable two-way communication systems, with speaking power up to 250W! Customisable sirens and red/blue/yellow LED-lights are easily integrated too.
- **TSS/JRZ Heavy Duty Suspension:** suspension systems for optimal handling, braking and comfort, customisable to different driving styles and passenger wishes.

TSS International takes pride in providing premium quality in all the products and services we deliver. Where possible, we test our products at renowned institutions such as TÜV, TNO, Beschussamt and our quality management processes are ISO 9001:2015 certified by Lloyds.

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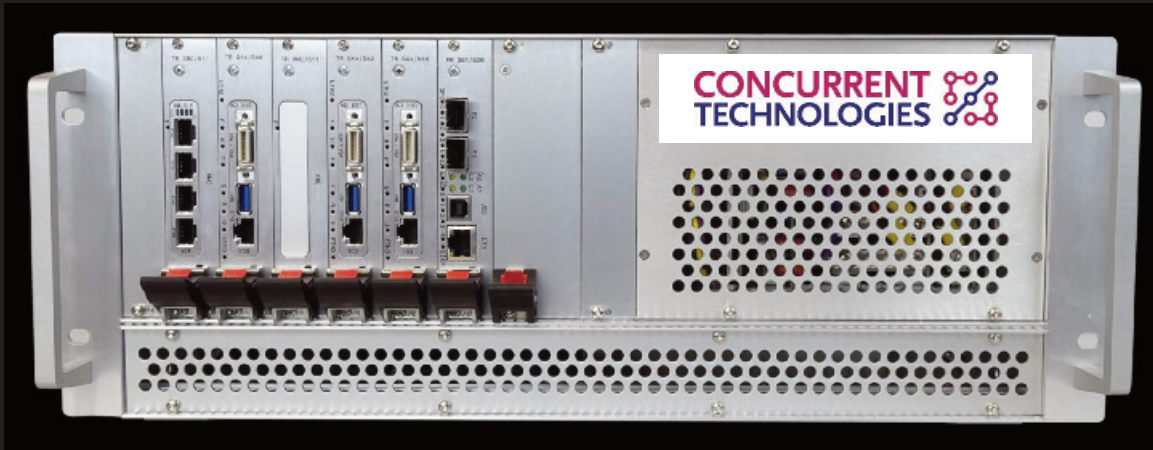


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Two of our recent developments push the boundaries of our VPX capabilities. TR L9x/6sd-RCx is our first SOSA aligned VPX Plug In Card with 100GB Ethernet Capability and TR K9x/6sd-RCx is a SOSA aligned 3U VPX Plug in Card with an integrated GPGPU for Artificial Intelligence (AI) Image and Processing...

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Maintaining wheeled vehicle mobility with Tyron Runflat

In the constantly evolving theatre of operations, protecting lives in high mobility vehicles is critical.

TYRON Runflat

Recent changes have seen the focus shift increasingly to urban operations where wheeled vehicles have a major advantage over tracked, heavily-armoured vehicles. The line between wheeled or tracked vehicles has further broadened with the significant growth of ultra-maneuvrable 6x6 and 8x8 wheeled platforms.

However, wheeled vehicles come with their own challenges. Most notably, their vulnerability to tyre strike, whether via ballistic attack or simply rapid deflation. In environments where this is a constant threat, equipping these vehicles to retain mobility and return to base safely is critical in ensuring the strategic safety and protection of personnel and the mobility of ground forces.

A recent market win for Tyron Runflat's technology highlights the continued demand for increased mobility and safety for military vehicle fleets, with the company's All-Terrain Rubber Multi-Piece (ATR-MP) runflats forming part of an industry package selected to upgrade the British Army's Ridgback and Mastiff vehicles for deployment to Mali.

The equipment upgrade was carried out by NP Aerospace to re-engineer the vehicles under the UK Ministry of Defence's (MoD's) Protected Mobility Engineering & Technical Support (PMETS) contract. This Urgent Capability Requirement contract, awarded to NP Aerospace in May 2020, includes an off-road mobility upgrade of Ridgback and Mastiff vehicles and associated spares. The upgrade was carried out in order to enable the heavy armoured vehicles that make up the Army's protected mobility fleet to operate in challenging operational terrain and keep British Army soldiers safe on deployment. Key to Tyron's work was delivery under significantly reduced timescales, with the first wave of re-engineered vehicles delivered in just over 80 working days.

"Our ability to meet this expediated timescale was central to the selection of our ATR-MP for this programme," Peter Simson, Director, Tyron Runflat, said. ***"In fact, we were able to dispatch the initial systems to the prime within 24 hours of receiving the request – thanks to our flexible outlook we have the ability to respond to requests such as these quickly and efficiently."***

As part of the package of the new vehicle system implemented – including new independent suspension systems, upgraded driveline, steering and braking systems, central tyre inflation systems (CTIS) and increased diameter tyres - Tyron's ATR-MPs will contribute to increased mobility and safety for the vehicle fleet, while also supporting simplified logistics in the field.

"As the ATR-MP is a multi-section runflat, it does not require any special tools or a hydraulic press to insert and remove the runflat when replacing the tyre, meaning it offers a huge advantage over single piece systems that require both of those things," Simson said. ***"In fact, in many cases when a single piece runflat needs to be replaced following a tyre strike they have to be flown to another country where bases are equipped to handle the repair."***

This means vehicles and their crews may endure significant downtime whilst repairs and replacements are sourced."

The NP Aerospace award is reflective of a wider trend among armoured vehicle users who are looking to maximise the utility of existing fleets by applying tried and tested technology to enhance flexibility and capability for current and emerging operational theatres.

"There is no such thing as a 'one size fits all' solution when it comes to military runflats, but we think the ATR-MP comes fairly close," Simson said. "We also continue to innovate in order to give our customers the widest range of options to suit their operational requirements, with recent developments focusing on helping military forces reduce the weight of their vehicles. This not only increases agility, but makes these vehicles much easier to transport by air despite the up-armouring and addition of Active Protection Systems to already heavy vehicles."

Tyron has approached this challenge with the inclusion of carbon cored rubber multi-piece runflats in its portfolio, which maintain the durability and serviceability of rubber and help reduce overall vehicle weight significantly.

"We recognise that every kg counts, and our ATR carbon runflats are up to 40% lighter than standard systems," Simson said. "That can result in a 250kg unsprung weight reduction on an 8x8 AFV."

Additionally, with forged aluminium also reducing mass

compared to traditional steel wheels, Tyron believes that future non-metallic developments that give improved blast protection whilst reducing weight will further enhance vehicle dynamics.

"The wheeled vehicle is not going anywhere in the medium term, if anything their deployment will continue to grow as conflicts shift to more urban operations where wheeled vehicles offer the tactical advantage over tracked," he said. "So, we continue to innovate and look ahead at the coming challenges our customers will face and explore how we can help overcome them to keep their vehicles moving and their personnel protected in the field."

All-Terrain Runflat technology goes back some 40 years, with the intent to give a wheeled vehicle with one or more tyres deflated the potential to continue to manoeuvre to a place of safety, over any terrain. Tyron's ATR runflats are designed to maintain mobility and safety during and after tyre deflation, whether due to ballistic attack, blowout, or puncture, allowing the driver and crew to continue the mission safely and return to base. The runflat guarantees beadlock, which prevents the tyre spinning on the wheel when deflated, enabling the vehicle to continue moving at speed in full compliance with on and off-road Finabel standards. The system is also fully compatible with CTIS and standard wheels, maximising its flexibility for the military market.

For more information on the range of Tyron Runflat solutions please email: peter@tyron.com
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Why is fidelity in underwater egress training important when preparing for a ditching?

Michael Taber, PhD, VP

Research and Development, N2M Consulting Inc.

Introduction

A helicopter ditching has been described as “an emergency landing on water, deliberately executed in accordance with rotorcraft flight manual (RFM) procedures, with the intent of abandoning the rotorcraft as soon as practicable” (European Aviation and Safety Agency, CS-27, Amendment 7, 2020). Given the fact that the landing is “deliberately executed,” there is an expectation that the aircrew has some control over the helicopter and that there is a possibility to minimize impact forces. A ditching (not an uncontrolled crash) typically has one of two outcomes: the helicopter either remains upright at the surface for a period of time, or it inverts. If the impact was minimal and helicopter remains upright at the surface (i.e., it is equipped with a floatation system), there is a high likelihood that survival rates will be nearly 100% (Taber & McCabe, 2007). If the helicopter inverts, it can be

immediate or somewhat delayed (Brooks et al., 2008). Although the severity of initial impact forces with the water is the ultimate deciding factor regarding overall survival, the ability to egress from an inverted and flooded cabin of a helicopter is influenced by a multitude of other factors (e.g., training, exit types/placement, injuries, age, breath-hold capability).

Factors influencing survivability

Previous research suggests that ditching survival rates when the helicopter inverts range between ~60% to ~70% (Taber, Sanchez, & McMillan, 2015). Past reports indicate drowning is the number one cause of death during a ditching. Given that impact is not the primary cause of death in these types of emergency events, it is possible to implement specific mitigation strategies that can increase survival rates. If the focus be placed on factors such as training, personnel selection, airframe design, or a combination of several factors, it would be expected that survival rates will improve. Based on the wide variety of helicopter operations, there is a myriad of factors that could potentially influence survivability. For example, military operations that occur close to the surface of the water, possibly at night, and/or in poor weather conditions present considerably more challenges than an offshore transport flight cruising at altitude on a sunny day over flat calm water near multiple support resources (e.g., standby vessel, installation/platform).

Operational context

From an operational standpoint related to ditching, the type of training related to known egress complications is one of the major factors that can be controlled. Based on past human performance research, it is clear that an individual who is trained to complete



METS - side roll

the tasks in a controlled setting with the exact same equipment they will be using in the event of a ditching is better prepared for a real event. Given the fact that humans rely significantly on visual cues to aid in skill acquisition, it is reasonable to assume that high physical fidelity simulation training should initially be conducted in the fully illuminated environments (Khan and Franks, 2004). However, once the skill has been acquired, it is possible to increase the complexity of the tasks in a variety of environmental conditions to ensure that performance assessment can be carried out under conditions that might be similar to an actual ditching.

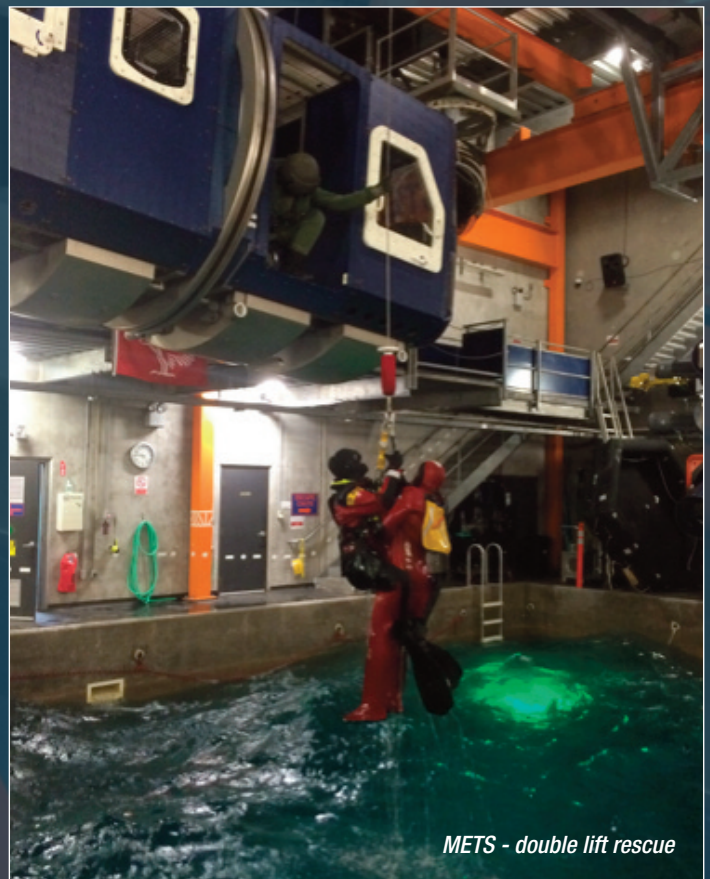
Inclusion of physical fidelity

The term physical fidelity describes “the degree to which a simulated environment replicates the look, sound, and feel of the real-world environment” (Hochmitz & Yuviler-Garish, 2011, pg. 490). In support of this point of view, adherence to physical fidelity aspects can be seen in every major airline pilot training program and most military programs. In fact, the Federal Aviation Administration (FAA), Civil Aviation Administration (CAA), European Aviation and Space Administration (EASA), and Transportation Safety Board of Canada (TSBC) outline the specific simulator requirements and training schedule required to certify pilots under instrument flight rules (IFR) conditions. In every case, the simulators must be capable of exactly replicating the physical flight characteristics (aerodynamics) as well as the operating systems and flight controls. Commercial pilots are required to gain certification in the specific type of aircraft they will be operating and research has shown that higher realism produces better performance outcomes (Hochmitz & Yuviler-Garish, 2011). Previous motor skill acquisition research, indicate “transfer from the first task (the simulation) to the second, real-world task occurs most efficiently when the two tasks have identical component activities. The more elements that are shared between the two tasks, the better the transfer” (Hochmitz & Yuviler-Garish, 2011, pg. 490).

The integration of physical fidelity during egress survival training ensures that individuals have the opportunity to practice the necessary skills under realistic conditions. Regardless of the environmental condition, skill acquisition research indicates that individuals should be required to demonstrate competence through whole task demonstrations. Without a practical demonstration of the skills under realistic conditions, individuals may experience difficulty integrating all the separate tasks in to one sequence during an actual ditching. Ideally, training programs physically and mentally prepare individuals for worst-case scenarios. Moreover, if standards of training are based only on minimal skill acquisition, individuals may find it difficult to cope with real life situations that are more dynamic and unpredictable than those experienced during their training (Brooks et al., 2007).



METS - troop interior



METS - double lift rescue

Final thoughts

There are obvious limitations to the level of physical fidelity that can be included in egress training; however, performance assessment standards that have had a thorough risk analysis completed and deemed safe should strive to include as many realistic aspects as possible. If carried out safely, egress training programs that begin with basic skills and build to more advanced ones including scenarios such as multiple personnel through one exit, use of emergency breathing systems, cross aisle egress, crash attenuating (stroking) seat, wind, rain, waves, and complete darkness will undoubtedly prepare individuals to a higher level and increase the likelihood that a positive transfer of training skills to an actual environment will occur. By extension, training organizations should strive to include more realistic environments that present similar challenges to those reported in actual ditching events, allowing for practice (correction of errors) in a controlled environment while under the supervision of trained professionals, which will ultimately increase survival rates.

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Will-Burt Elevation Systems

MOBILE SURVEILLANCE

COMMUNICATIONS

PAYLOAD POSITIONING

Stiletto

- Electro-mechanical telescoping mast family
- Composite or alloy

QEAM

- Family of portable guyed field mast
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KVL and KVR

- Vehicle, shelter, trailer or field-mounted cable-driven masts
- KVL - light duty, KVR - heavy duty

SPM

- Payloads up to 1300 lbs (600kg) of platforms
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Pneumatic Masts

- Locking or Non-Locking
- Heavy duty options available

PositionIt

- Maintenance-free mobile pan and tilt positioner
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- Higher gear ratios generate lower speeds to provide smooth operation for optimal sensor and antenna performance





Designed for mission-critical applications, Will-Burt's extensive offering of products provide the performance essential for military success. Our solutions are designed and manufactured to meet the most demanding environmental requirements and are tested to MIL-STD-810 standards. So whether in the field or on the front lines, warfighters can be assured fast, optimal performance every time.

Along with telescopic masts, The Will-Burt Company offers a broad selection of lattice towers, pan and tilt positioners and accessories to elevate a variety of mission critical payloads. Each family of elevation solutions is designed and manufactured with a unique set of characteristics tuned to optimize payload performance and meet the most stringent performance criteria. High performance tactical trailers round out the military offerings of The Will-Burt Company.

Whether your program requires a commercial off-the-shelf solution or a highly engineered customized product, The Will-Burt Company has the experience, design know-how and manufacturing capabilities to meet your unique requirements.

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The Will-Burt Company is an international company with offices and manufacturing in the USA, United Kingdom, Germany, Turkey, and Singapore. All manufacturing locations are backed by a certified ISO 9001:2015 Quality Management System.

To learn more about of our products visit our website www.willburt.com or contact us for more information at +1 330 684 4000.



CAN YOU TRUST YOUR GNSS?

Global Navigation Satellite Systems (GNSS) are widely used in safety and value critical applications and many stakeholders and applications as well as critical infrastructure providers rely on them.

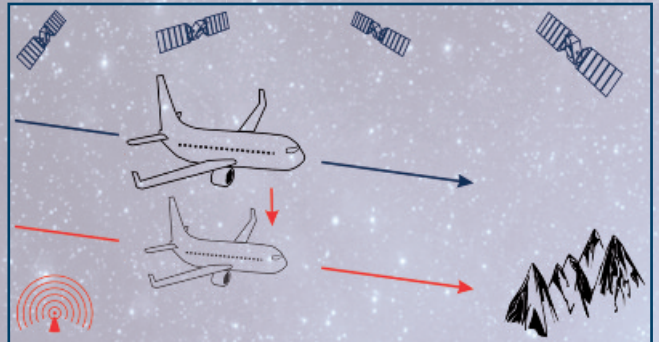
In recent years, GNSS applications have become the target of intentional interference attacks. Dangerous portable devices can cause considerable economic but also material damage. Jamming and spoofing signals can significantly influence the operation of GNSS. This can lead to degraded position accuracies or to a total failure of the positioning.

Interference incidents are real and can cause severe damages:

- Shutdown of navigation equipment at Newark airport
- GNSS attacks of North Korea against South Korea
- 117 incidents within one day at Kaohsiung airport in Taiwan
- A U.S. military drone was forced to land
- A 65-meter yacht drifting off course during field trials
- Failure of emergency pagers, traffic management systems and ATMs in San Diego caused by U.S. Navy jamming

Thus, the question arises, what to do against GNSS interference? Awareness is the key. Most GNSS users are unaware of the hazardous impacts GNSS interference can have on their application or operation. Therefore, crews should be aware of such attacks and it is advised to make cross-checks with other independent navigation techniques.

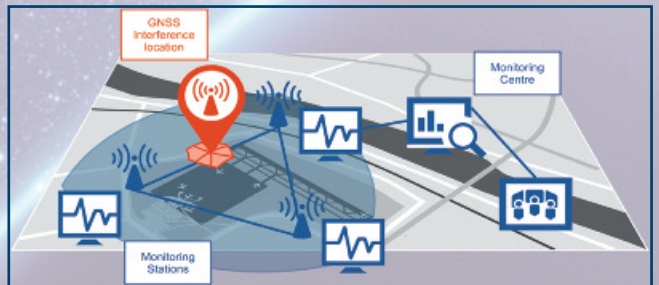
Detection of RFI is the first step towards mitigation. Only if GNSS interference attacks are fast and reliably detected it is possible to deploy countermeasures.



The GNSS Interference Detection and Analysis System (GIDAS), offered by OHB Digital Solutions, enables a continuous 24/7 monitoring of the GNSS frequency bands within a defined region to automatically detect, classify and localize intentional interference by means of jamming and spoofing.

The system works autonomously and is designed to be easily deployed. It is scalable and flexible; it can be used as a standalone monitoring station or upgraded to a network of stations.

In September 2020, the first GIDAS monitoring stations were installed at the Czech airport in Brno. Initial GIDAS reports show an average of seven GNSS interference events per day. GIDAS was able to successfully classify the signal type in 96% of jamming cases that occurred.



GIDAS

GNSS Interference Detection & Analysis System

- Real-time GNSS signal monitoring (multi-signal and multi-band)
- Jamming + spoofing detection including automatic alarm generation
- Classification + localization of GNSS interference signals
- Reliable, configurable, flexible, scalable and easily adaptable system
- User definable + predefined (e.g. ICAO, RTCA) threshold masks
- Graphical user interface and network solution



GIDAS helps to protect your critical GNSS applications



Supply Chain Resilience with Defence Coatings Made in Britain

With supply chain disruption due to Brexit and the pandemic, HMG Paints, the UK's Largest Independent Paint Manufacturer, have been working with a number of new defence clients to help them build supply chain resilience.

Ahead of its attendance at DSEI 2021 later this year HMG Paints, Alan Sharples, HMG Defence Sales Manager commented, ***“2021 has seen us working with a number of companies who’ve been impacted by the current situation. Many have struggled to acquire paints and coatings which were previously imported from abroad”***. The company will be showcasing its range of Made in Britain paints and coatings to the defence industry from **stand H4-415** at the Excel London between 14th to 17th September.

The Manchester based paint manufacturer has a vast portfolio of products including paints free from Chrome VI, low VOC, and IRR and CARC resistant coatings. Companies working with HMG are looking for resilience in their supply chain along whilst still ensuring they receive a premium quality product and service. HMG Paints were the first independent UK Paint Company to be awarded British Standards quality BS5750 (FM1524) and have won the Coatings Care Award numerous times which is important for customers looking to work with suppliers based on their socio-environmental impact.

“With more and more paint manufacturers offshoring production and decision making we feel HMG can provide a unique offering to OEM’s and refinishers within the defence market” commented Alan. ***“Before DSEI2021 we’ll be visiting and working alongside a number of new partners to assess their coatings needs and support them by supplying a range of standard Def Stan coatings or working with them to develop innovative bespoke paint and coatings solutions.”***

Like many businesses, HMG Paints is also now utilising remote meeting and communications technology when working with customers. Customers are now able to book video calls with the HMG sales representatives and technical team by simply emailing **defence@hmgpaint.com** to discuss their coatings needs or can utilise the online chat support across HMG’s various online channels.

All coatings, including additional Def Stan coatings from Temporary Marking Paint and Walkway Coatings to Environmentally Compliant 2K Epoxy Topcoats are Made in Britain and distributed across the globe and supported by industry leading technical support. The company will be offering product advice and technical support on **stand H4-415** at DSEI 2021. If you’d like to book a meeting slot or require information on the HMG Paints products you can email **defence@hmgpaint.com** and a member of the team will assist you.

To see a full list of HMG Paints products and services visit **www.hmgpaint.com** via the website you can also find out more about the company’s history and partners. You can see a full profile of HMG Paints on the Made in Britain website by visiting: **www.madeinbritain.org/members/hmg-paints**

If you require further information on the press release, please contact: **Gracienne Ikin** or **Stephen Dyson**
HMG Paints Communications **gikin@hmgpaint.com** or **sdyson@hmgpaint.com** **T: 0161 205 7631**





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Each set of units join to form a TEU (Twenty Foot Equivalent), can be separated and moved on location.



Event Reefer Container

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Dual Temperature Reefer

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THE POLYAMP BUSINESSES

Polyamp has two main sector of operations:

- Naval Electromagnetic Signature Management Systems
- Industrial & Mil Grade Power supplies & DC/DC Converters

SIGNATURE MANAGEMENT SYSTEMS, SYSTEMS DIVISION

The Polyamp Systems division designs and supply electromagnetic underwater signatures suppression and detection systems. Polyamp is active worldwide and customers include Prime contractors, Shipyards, Navies, Governments and the International Naval Community.

Polyamp supplies Military Systems such as:

- Degaussing Systems from Carrier to ROV
- Underwater signature measurement systems

- Multi Sensor Underwater platforms UMISS
- SWECADE Magnetic signature Design and Measurement
- UEP/ELFE sensors and systems
- Electromagnetic Mine sweep from RHIB/ROV

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

SYSTEMS DELIVERIES AND EXPERIENCE

The company has more than 40 years' experience of Degaussing systems for large to small Naval vessels and conventional submarines. All are digitally controlled with Magnetometer(s) for optimal signature under any condition.

The UMISS system collects underwater signatures as single platform or multiple and SWECADE can optimise the magnetic ranging process.

NAVAL UNDERWATER SIGNATURES SUPPLIES

They include:

- RSwN (14 platforms)
- Range Software; SWECADE.
- Singapore Navy (8 platforms)
- US Navy (12 platforms)
- Royal Danish Navy (7 platforms)

Other Systems delivered are:

- Multi Influence Sensor Systems for France; (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 Enedo-Powernet products.

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

Applications include:

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- 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

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SPECIALIST IN NAVAL UNDERWATER ELECTROMAGNETICS SIGNATURES & POWER SUPPLIES

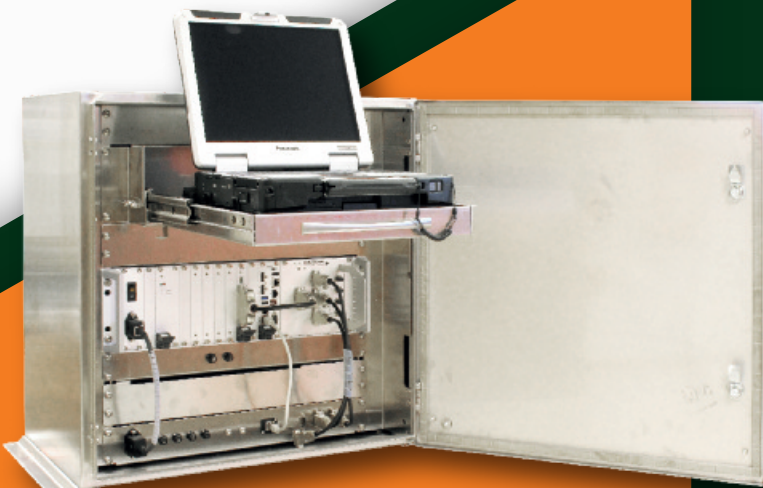
We are specialised in designing and manufacturing Degaussing systems and underwater electromagnetic signatures measurements and suppression systems for Naval vessels. We produce a long life UEP/ELFE sensor, used in sediment analyse, ships signatures and "harbour" surveillance systems.

Polyamp's base is a wide program of high reliability and performance Power supplies and DC/DC converters.

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G&H further expands its R&D capability with new Optical Systems Innovation Hub

At G&H, our commitment to translating innovation into action drives the creation of new environments that optimize our teams' ability to develop and commercialize new ideas, products and customer solutions. This is the strategy behind both the launch of our Optical Systems Innovation Hub in a brand new facility in St Asaph, UK.

Over two floors, the specialized engineering environment houses our growing development engineering team comprising specialists in fields as diverse as optical design, opto-mechanical analysis, electronics development, system testing and integration, set to further our focus on application areas including aerospace and defence (A&D), space, life sciences and more.

The Hub also has the necessary cleanroom space to allow for development and functional verification of new concepts and product designs in the relevant operational environment. At the same time, it is the launch pad for our product management and sales team specializing in optical systems, creating a seamless and effective interface between our commercial and engineering functions.

Our Hub creates a seamless and effective interface between commercial and engineering functions.

So, why is the Hub such exciting news for us, the customers and OEMs we already have, and industry prospects with a challenge in search of a solution?

The Optical Systems Innovation Hub: a step-change in value delivery

Firstly, the Hub significantly expands our R&D capability, with a dedicated team that will work on customer-driven product development projects as well as market-driven internal products, and adjacent and independent fields of research, exploiting technology synergies.



Cleanroom at St Asaph



Secondly, it takes G&H into a new phase in its delivery of value to customers, since it strengthens our ability to design and build not just photonics and optics components, but the associated electro-optical subsystems and systems.

The Hub's objective will be to design and develop optical systems with differentiated performance enabled by our state-of-the-art component base in our manufacturing facilities in the UK and US. The close link and recurring design process between the system and component is expected to create the rapid technology transfer and added value required by our customers through an effective new product development process.

Customer collaboration is pivotal to the journey from concept to integration.

Thirdly, the Hub enables us to engage with our customers very early on in the development process. Collaboration in this conceptual phase has been shown to be pivotal for optimally setting the system requirements by leading the technology and component trade-off analysis right at the beginning of the journey. This means we are not only able to take a product from specification to final integration, but to help drive both the initial concept development and ongoing project scope, factoring in design improvements to anticipate product issues before they even find their way into the risk register.

In short, the Optical Systems Innovation Hub is helping G&H deliver strongly on all fronts – research, design, manufacture, integration, assembly – and create a business that is as much about expertise in end-to-end solutions as excellence in component-level manufacturing.

One of the early successes of the Hub has been the development of an AFV sighting system; the next generation of the Sabre - the Sabre-TI. With TI standing for thermal imaging the new version of this compact commander/gunner's sight now offers tank crews the opportunity to identify otherwise hidden targets. The integration of thermal imaging technology is illustrative of the G&H approach to devising solutions which will add value for end users and so enable customers to be more competitive.

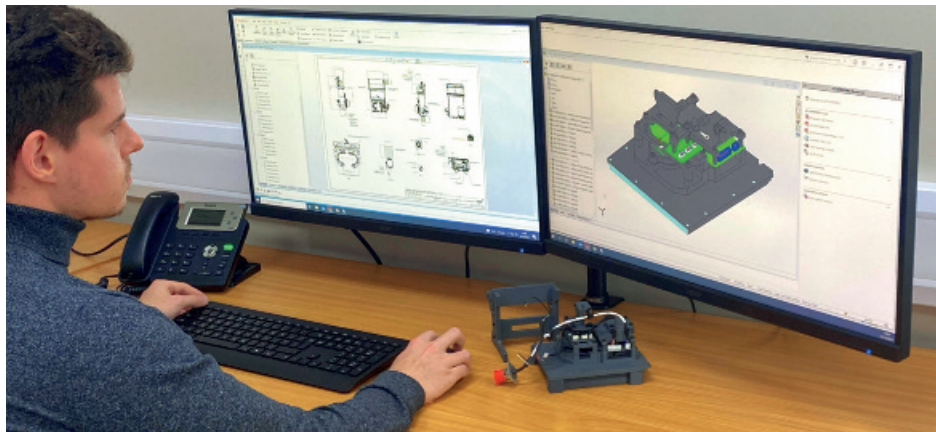
What innovation will take place at the Hub?

The Hub will build on and extend an existing track record of successful G&H component and systems development across many different market verticals. To cite just a few examples, in the A&D arena, it will enable us to expand the integration and delivery of optical systems that employ precision optical components manufactured in-house for applications such as sighting systems, imaging systems for intelligence, surveillance and reconnaissance, directed energy weapons and satellite laser communications.

The team will work on designing and developing next-generation optical systems that will enable increased situational awareness in A&D, lightweight optical payloads in aerial and space platforms that use innovative optical design, state-of-the-art components, sensors and image processing.

Drawing on our expertise in other parts of the business, the Hub will gradually expand into designing more functional systems with internal G&H content, delivering high performance and increased value to our customers. In any industry or deployment where there is a need to design, develop and deliver subsystems of these types, repeatably and at scale, G&H will now be better placed than ever to answer the call.

G&H's Chief Commercial Officer, Stratos Kehayas commented: "From sighting and imaging systems in aerospace and defense to minimally-invasive surgery, biomedical imaging systems, and industrial lasers, the key is always that intimate interface between the optical design and the precision optical components used to build them. We have to remember that



the language of photonics technology is universal, and we are very fluent in speaking it!"

How to access the Hub

Whether you are an existing customer or you have just found out about our capabilities and technologies, the Hub can act as the first port of call for your challenging project. Our intention is that the Optical Systems Innovation Hub will be an accessible resource that facilitates easy engagement, so getting in touch with it is as simple as using the contact information below.

As ever, G&H is committed to changing the world with photonics – and with the Innovation Hub, we're shifting the changes up a gear.

For further information on the G&H Optical Systems Innovation Hub, email info@gandh.com.

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19-inch Rack Cases for IT Equipment Transport

Nowadays, the deployment of armed forces is more complex and varied than only a few years ago.

The demands made on equipment are steadily increasing, and IT infrastructure also remains an important issue. Data security, encryption, and interception protection present challenges not only to persons responsible, but also with regard to delivering equipment to operational areas and combat zones.

State-of-the-art equipment, such as servers for radio and telecommunications technology, as well as control, monitoring and reconnaissance systems are transported to military bases across the globe for on-site usage. For the entire duration of deployment, these systems must be protected against

inclement weather effects conditions which can cause dust, sand and humidity to ruin IT equipment, but also protect against vibration and shocks during transit.

The ideal transport solution to protect IT equipment is a portable 19-inch rack case, preconfigured at the home base. Specialists are able to combine and configure all systems as one unit, enabling them to connect only a few cables at the location of deployment with plug-and-play system, thus allowing units in combat and operational zones to deploy IT equipment as quickly as possible.

However, these cases must meet high standards. They must contain a durable 19-inch interior rack mount for electronics, possess a certain lid height for storing connectors and cables, and provide customizable options for any application.

In transit, the case must prevent shock and vibration from

affecting the sensitive equipment and to ensure effective protection against external forces caused by inclement weather conditions such as rain and dust.

At the place of deployment, easy handling, for instance thanks to (permanent) casters or stackable cases, is crucial to create and maintain a functioning infrastructure.

"We are aware of all of these requirements and have been focusing on cargo cases for 40 years. It is often the small details that matter," notes Piero Marigo, Managing Director. "Many devices have varying degrees of sensitivity to external influences, which may require, for instance, installing so-called shock mounts."

Peli-Hardigg is a manufacturer of 19-inch rack cases made of High Impact Polyethylene with built-in rack mounts for storing all types of electronics. Shock-mounts are bumpers/shock absorbers made of elastic plastic or other materials that buffers the electronic devices from the outer frame of the case. Peli Hardigg Rackmount Cases are rotational moulded and can be customized and manufactured based on the customer's needs, or selected from one of the three immediately available product ranges. With a total of 8 product ranges for varying requirements and the option of customization, the manufacturer provides a wide range of 19-inch cases.

Levshin further comments: "The total height of the devices, the depth (length) of the devices, the weight to be loaded, as well as the so-called G fragility rating of the system components are important factors for the initial selection of the ideal rack case."

The G fragility rating indicates how well a an electronic device is protected against shock on its own. The unit of measurement is 1G. A fragility rating of 10 G would indicate that in case of impact, a device would be damaged at ten times the rate of acceleration of the earth's gravitational pull. For sensitive electronics, especially those intended for installation in switch

and server cabinets, protection is not usually very high. For comparison's sake, a computer tower has a G-fragility of 25G and raw chicken egg breaks at a force of 10-15 G.

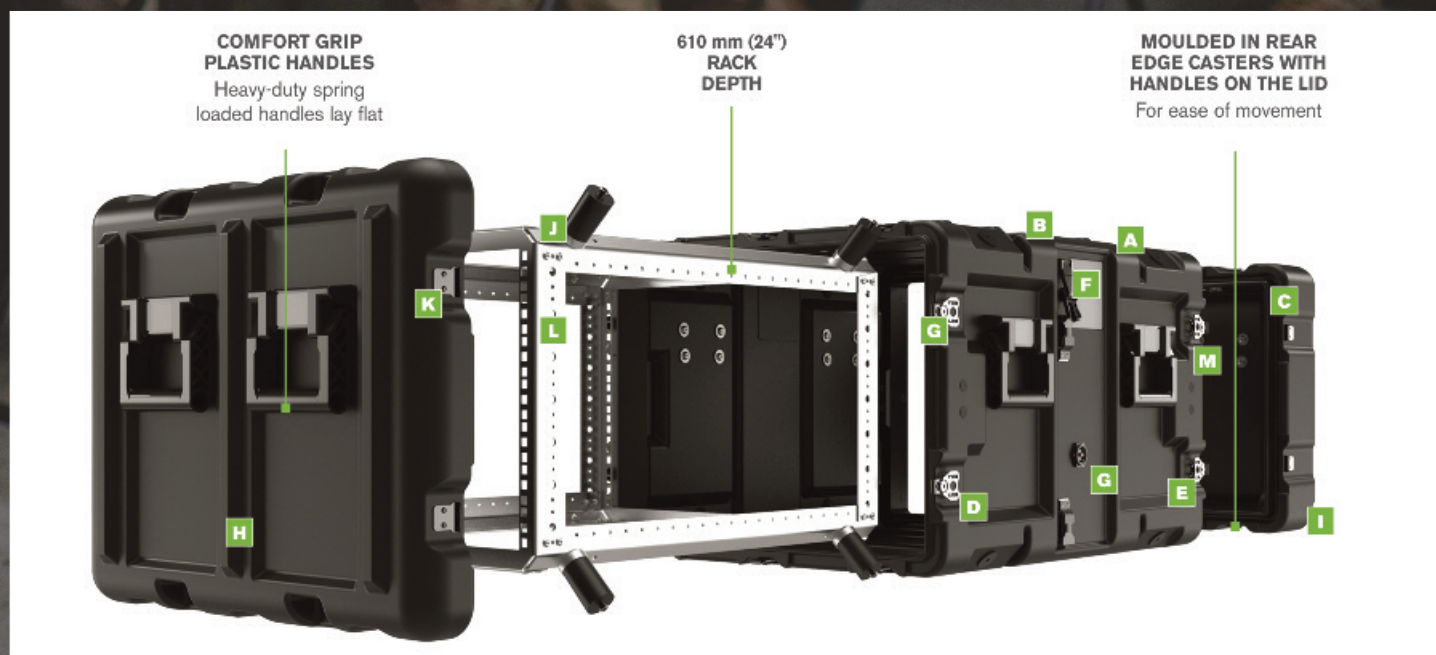
Therefore, mobile 19-inch rack cases are designed for varying sensitivity classes and customized for actual requirements by selecting the ideal rack mounts.

"Thanks to a wide range of additional options, Peli-Hardigg is able to meet nearly all customer requirements by accomodating from 3 to 27 rack units." This includes removable or permanent casters, 19-inch pull-out rack mounts and drawers, as well as pockets in the lid for storing cables, documents and casters during use. The choice of the exterior colour is also customisable and is another factor to take into account because for instance, it can impact the interior temperature of the case. Even simple details, such as the option of being able to attach the lid on the side during use, or small casters in the lids for easy handling make it possible to find the perfect solution for any user," concludes Levshin.

The height unit (HU) or rack unit (RU /U) is the unit that determines the height of devices built into the 19-inch design. One rack unit corresponds to a device height of 1.75 inches or 44.45 millimetres.

The demands of armed forces and government agencies will continue to evolve in years to come and require increasingly complex and simultaneously flexible tasks. Decentralized solutions with mobile command centres and local networks can only be provided and developed with a mobile IT infrastructure. The challenges of shipping and delivering equipment to remote areas should not be underestimated in this context and considered during the planning stage of the entire IT infrastructure.

You can find more information on the topic on the manufacturer website www.peli.com



BESPOKE PACKAGING SOLUTIONS



EVALUATION

DESIGN AND
ENGINEERING

PROTOTYPING
AND TESTING

MANUFACTURING

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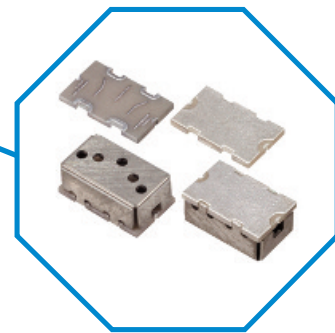


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- Ideal solution for pick and place and harsh environment applications

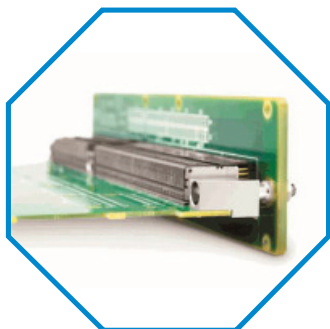
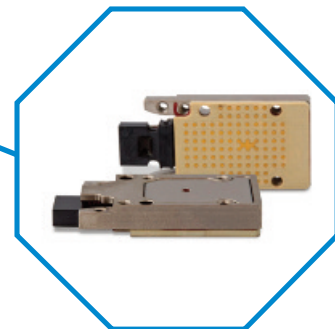


SnapTac® Connector Series

- Lightweight, robust, quick release miniature connector, featuring IP67 sealing and EMI shielding
- Available in both circular and rectangular styles and equipped with Hyperspring contacts

Optical Embedded Transceivers

- Offering bandwidth up to 300 Gbps well suited for small, compact systems requiring high I/O density, low power, and small space
- MIL-STD 883/202/810 qualified, radiation tested



KVPX Series

- Rugged high speed, Backplane Connector System compatible with VITA 46, 47 and 78 standards
- Shielded, high-density, modular interconnect optimized for differential pair architectures on a 1.8mm x 1.35mm grid

AQUA LUNG

Military & Professional

OPEN CIRCUIT DIVING EQUIPMENT FOR THE MILITARY USER

Aqua Lung has a full range of equipment for the open circuit military or professional diver. This range includes regulators, buoyancy compensators, analog and digital gauges, and all accessories to fit virtually every mission requirement.

MILITARY DIVING & TACTICAL



SURFACE, TACTICAL, WATER RESCUE, AND SAR SWIMMER EQUIPMENT

In addition to traditional diving equipment, Aqua Lung has a full line of equipment for the surface, tactical, water rescue, and SAR swimmer. This equipment includes specialized life vests, masks and fins, boots and gloves, and mission-conf and load bearing harnesses for rebreather usage. Obviously, the use and distribution of this equipment is very specific and only available to authorized users. igured emergency breathing systems.

CLOSED CIRCUIT DIVING EQUIPMENT FOR THE MILITARY USER

Aqua Lung has a full range of closed and semi-closed rebreathers for specific military mission requirements. In addition to this hardware, we also have a full line of lifejackets and weight integrated



www.aqualung.com/militaryandprofessional

CONTACT US

For further information and friendly advice...

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PELI
BIOThERMAL™

Peli BioThermal's patented Golden Hour™ technology

There's good reason Peli BioThermal's patented Golden Hour™ technology received the U.S. Army's Greatest Invention Award in 2003.

Prior to this, there was no effective container to safely transport critical blood to troops fighting in far forward combat areas away from fixed medical facilities. That fundamentally changed when we invented Golden Hour technology — aptly named because it provides troops access to the whole blood, platelets or plasma they need to save lives during the critical first hour after injury.

This innovative thermal transport container protects the products you need no matter the location or extreme conditions on the battlefield. For the last 17 years, military personnel have trusted our technology to securely, reliably and safely transport pharmaceuticals, tissues, biologics, diagnostics, vaccines, blood supplies and more from anywhere in the world — to where they need it most.

The award-winning Original Golden Hour™ technology was developed to protect troops' lives on the base and on the front line in the harshest of environments and climates. Today, Peli BioThermal's packaging solutions provide the most reliable, longest temperature control duration on the market — 96 hours of thermal protection. Life-saving materials are housed in smaller, lighter weight, rugged and durable temperature controlled Credo™ shipping containers without the need for dry ice or water / gel packs.

PELI BIOThERMAL PROVIDES:

- A full range of single use and reusable temperature- controlled packaging options that cover the full range of the military's needs — chilled, frozen, controlled room temperature (CRT).

- Optimised payload ratio that reduces distribution costs by minimising outer dimensions and maximising interior payload capacity with 100% available for product.
- One hundred percent recyclable components that reduce your impact on the environment.
- A web-based asset management software solution (Credo ProEnvision) to track individual shipments around the globe, set up automatic maintenance, next shipments alerts and produce customisable reports.

OUR PRODUCTS:-

Golden Hour™ Mobile

Also known as the Original Golden Hour™, this product is the foundation stone of our business and the Winner of the 2003 "US Army's Greatest Invention Award".

WHY SELECT GOLDEN HOUR™ MOBILE?

- Ease of use — modular design for quick assembly and efficient inventory storage
- Nimble and tactical for delivery of whole blood to the point of injury within a crucial window of time
- Designed and tested to last in the harshest conditions.
- Quality, durable construction

Temperature ranges - +2C to +8C, +15C to +25C

Volume -2L

Duration — 48 to 72 hours



Golden Hour™ Medic

A recent addition to our range, the Golden Hour™ Medic is a nimble and tactical option for delivery of whole blood to the point of injury within a crucial window of time and can be easily transported to the front line. Golden Hour™ Medic replaces traditional cumbersome containers and can keep 2 units of blood cool for up to 24 hours in extreme conditions, 3 days in optimal conditions.

Credo™ Cube

Superior thermal protection in a convenient mid-size container. The Credo Cube™ is a passive and reusable shipper qualified to hold chilled medical materials at a safe temperature for up to five days. This system is ideal for reducing shipping costs or for circumstances in which unexpected delays may occur. Available for volumes from 2L to 96L, frozen, chilled and ambient temperature profiles. Also available with a hard, impact-resistant outer shell – Credo™ Duracube HD

Credo™ Duracube HD

The Credo Duracube™ product line offers a selection of superior thermal protection in a comprehensive range of lightweight and heavy duty hard shell outer containers (between 2L and 96L) designed to strike an optimal balance between case weight, durability and duration of transit capabilities while providing a 10-15% increase in thermal performance over outer corrugated material. Available in frozen, chilled and ambient temperature profiles.

Credo™ ProMed

Designed specifically for the dynamic needs of emergency first responders, the Credo ProMed™ product line currently consists of three different sized temperature-controlled portable medical transport bags that thermally protect the integrity of valuable pharmaceuticals and medical supply payloads for 72 - 96 hours. The outer bag is constructed of highly durable ballistic nylon fabric and the patented TICTM panels with phase change material and VIP components contained within, are qualified to consistently protect medical materials such as blood, platelets, bio-pharma product samples within two ranges, chilled and ambient

Credo™ Xtreme

This high performance, extremely durable and reusable passive temperature controlled pallet shipper is offered in two sizes (371L and 807L) and is ideal for consolidating large domestic and international cargo shipments. Peli BioThermal's Credo™ patented technology provides a revolutionary cost effective temperature-controlled pallet shipper that ensures secure transport of bulk pharmaceutical products – qualified to maintain the required temperature range for 120 - 144 hours. Easy removal and installation of the TIC™ (PCM) system, greater volumetric payload size and a reduced risk of product compromise.

www.pelibiothermal.com
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+44 (0) 1525 243770



AirBorn

www.airborn.com

Meet verSI:

The connector engineers love

Rugged Reliability

Designed to meet demanding requirements of high speed signal integrity applications, AirBorn's verSI range offers engineers the versatility needed to suit any interconnect situation.

Utilizing a 1.27mm pitch, the high speed connectors feature standard options ranging from 10 to 500 contacts in a single connector body.

Versatile Design Modularity

The verSI product range offers vertical board-mount, right-angle board-mount, cable I/O, and flex circuit mounting options to satisfy any OEM box design challenges. The same high performing IO interconnect interface can be used inside the box, streamlining the design process.

verSI works seamlessly as part of cable or flexible circuit assemblies. Both cable and flex assemblies are manufactured in-house at AirBorn. Designers can choose from a wide variety of standard cable and flex options or work with AirBorn's Solutions Engineering team to develop a custom solution.

Versatile Space Saving

verSI's micro-density, small footprint frees up real estate on the PCB, within your cable harness, or on any electronic unit. Sizes ranging from 10 position to 500 positions give systems designers ultimate flexibility.

Versatile Stacking Scalability

verSI's range of six different vertical-to-vertical stacking height options allow ultimate board mount design flexibility without compromising on performance.

Space Flight Heritage

The verSI range can be found in a variety of space applications ranging from satellites to launch vehicles.

High Reliability

Defense electronics require extreme high reliability in demanding environments. The verSI range includes a ruggedized metal shell to ensure performance in high shock and vibration environments. verSI connectors feature a low mating force/high-reliability contact system with four reliable points-of-contact. It is also a very reliable and rugged mate that is sure to maintain contact under extreme vibrations. The open-pin field design allows for flexibility in termination schemes. verSI are designed to withstand 10,000 mating cycles offering performance and reliability over the life of their application.



Bringing Your Innovations To Life

Mercury House, Station Rd., Edenbridge TN8 6HL, United Kingdom



Extending maritime Special Operations capability by optimising Tactical Diving Life Support System ergonomics and duration.

Tactical Diving in the 21st Century

When facing peer or near peer adversaries, the viability of inserting a fully equipped military Tactical Diving (TD) team by small inflatable craft to within realistically achievable swimming distances of an objective is rapidly declining. This is as a consequence of emerging sophisticated land, sea and airborne sensor / weapon systems that are able to reach deep into the littoral zone.

Crossing the increasingly expanding 'water gap' discretely and covertly is therefore presenting a number of challenges to maritime SOF and increasing use is being



made of submersible Tactical Diving Vehicles (TDV).

Development

The underwater breathing apparatus 'work-horse' for Tactical Diving since World War Two has been, and is predicted to remain, the closed-circuit oxygen rebreather. Such systems are technologically simple, relatively small, light and robust, precisely what the maritime SOF Operator requires. Typically, the Tactical Diver wears the rebreather on the front, which is often the best location when conducting long distance sub-surface swimming. However, the increasing use of TDVs by maritime SOF to cover even further distances, requires a rebreather specifically designed for back worn use that provides unhindered field of view and access to TDV controls together with the ability to lie flat on the vehicle when using smaller TDVs.

Solution

Shadow Back Mount (BM) is the latest variant of the operationally proven JFD Shadow Tactical Diving (TD) Life Support System (LSS) used by maritime Special Operations Forces (SOF) globally. Developed under the JFD 'Swim & Fight' principle of tactical diver performance enhancement, besides optimising the design

for TDV operations, Shadow BM readily facilitates the transition between sub-surface operations and land warfare, enabling operational field equipment and weapons to be immediately accessed once at the water land interface.



To enable extended duration TDV operations requires a life support system that is capable of safely supporting such operations. Providing an un-parallel duration capability, Shadow BM has a CO₂ absorbent canister that provides a four-hour duration at 40RMV or five-hour duration at 30RMV in cold water thus enabling long duration TDV operations.

SHADOW BACK MOUNT





NANUK is proud to introduce the **NANUK 975** series, the most **configurable** waterproof protective case available from the brand that everyone's talking about!

With 4 configurations to choose from, 975 - 975W - 975T and 975M, we've made sure to have a version for almost any user's preference. The full-featured base model 975 includes our rigid, two-stage retractable handle and two double wheels with stainless steel ball bearings. On the other end of the spectrum, our 975M is lightweight and features oversize ultra-strong team-carry handles. Want even more choices? Try the 975W and 975T. Both are infinitely configurable, with available accessories for immediate or future needs. We call that **long-term value** in a protective case!

975



975W



975T



975M



With its large interior dimensions, 30" x 21" x 18" (762mm x 533mm x 457mm), the possible usage of this robust case is also infinite. You can organize, protect and carry multiples sets of small tools, mobile medical equipment, defense systems, sensitive electronics, industrial tools, photo and video equipment, and much more. If your project requires a customized solution for holding the contents of your protective hard-sided case, our custom foam interior option is the way to go.

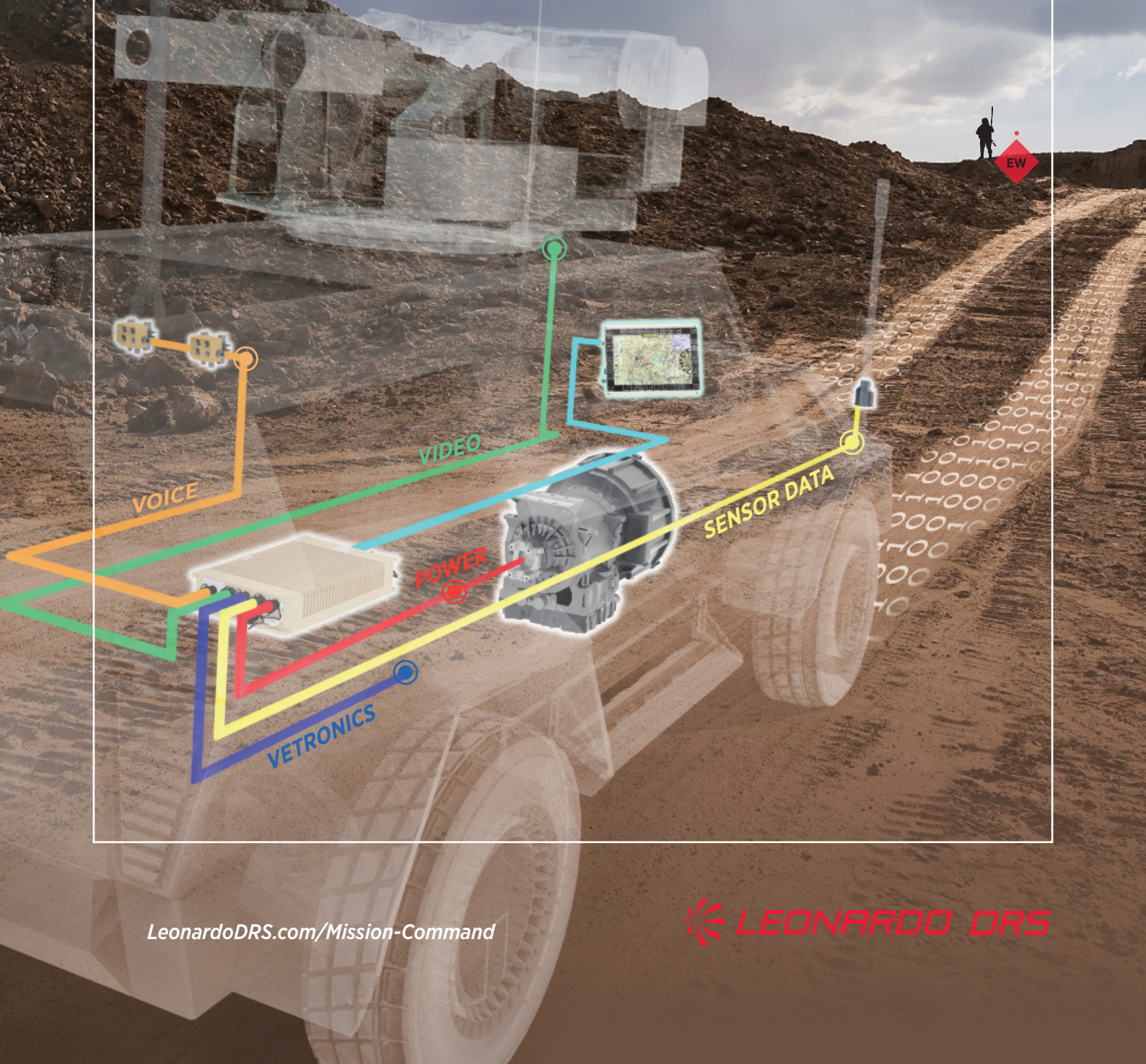
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