MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 16

MPE PEOPLE

Institute of Directors recognition for Paul Currie

Paul Currie, Sales and Marketing Director of MPE, has undertaken studies with the Pall Mall, London, based Institute of Directors (IoD). After four separate examinations, he attained his Certificate in Company Direction and later successfully sat another exam for his Diploma in Developing Board Performance, both achieved with distinction. Paul's leadership and direction were also recognised by the IoD as a Finalist in their prestigious 2018 awards, being nominated as one of five Finalists in the Global Director of The Year category. Paul is now completing work towards his Chartered Director status with the IoD.

Click for more details

Spotlight on Steve Eginton

MPE's Quality Manager since May 2013, Steve Eginton is responsible for all Quality-related, Health and Safety, and Environmental Management (ISO14001:2015) activities within the company, handling the key area of customer approvals. Steve facilitated the transition from ISO9000:2008 to ISO9000:2015 accreditation. One of his primary functions is to ensure that MPE's expected ultra-high product quality standards are fulfilled and maintained. Notably, in 2017 Steve undertook training for his Six Sigma Green Belt certificate. For this he participated in theoretical training one day a week, whilst also completing practical project work on current applications at MPE.

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MPE TECHNOLOGY

MPE invests in automated carousel

A new automated carousel enables the storage of some 140,000 components within a 20 m^2 footprint at MPE. Previous storage occupied a footprint 20 times larger and across several disparate areas. The floorspace freed up by the carousel now allows MPE to kit parts for orders four weeks in advance of assembly, whereas, before, parts could only be kitted for orders two weeks in advance. The automated retrieval of parts for kitting has also significantly reduced the time taken to kit the parts required to fulfil individual orders, helping to increase on-time deliveries by some 30%.

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PCI compliance at first time of asking

In-house OrCAD PSpice electrical design modelling and pulse testing at MPE are providing a high degree of confidence that, during later external PCI testing, HEMP filter designs will meet Mil-Std-188-125 without costly and time-consuming design modification work. MPE's library of component designs replicates real world conditions, whilst its pulse testing capability accurately represents the Mil-Std E1 pulse for testing and optimising new and variant designs. The Marx pulse generator comprises an 8/20µs pulse tester for bulk current handling tests with a pulse current of up to 5kA, and a 5/200ns pulse tester for rise time checks.

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MPE DISTRIBUTOR NEWS

MPE distribution expands into Japan

MPE has appointed Tokin EMC Engineering as its distributor for Japan. With HQ in Kawasaki, Tokin EMC also have facilities in Osaka and Tsukuba, with their locations in all three cities boasting 10-metre anechoic test chamber facilities. MPE has seen a strong increase in interest and sales of filters to Japan and recognised that a strong local distribution partner was the key to realising further growth within the territory. In April Tokin EMC exhibited their product solutions and

MPE at DefExpo India & Eurosatory

In April MPE supported its new Bronze Distribution Partner for India, Strongfield Technologies, at the tenth biennial DefExpo India in Chennai, opened by India's Prime Minister. As regular exhibitors at DefExpo, Strongfield took a large stand space to showcase their principal offerings including MPE's ranges of EMC, EMP and TEMPEST filters. During June MPE equally supported its Silver Distribution Partner for France, Euromip, at the biennial military vehicle show Eurosatory, amongst more than 1800 exhibitors from

services, including MPE HEMP filters, at the major annual Techno-Frontier trade show held in Chiba City, Tokyo Bay.

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63 countries packing the Paris Nord Villepinte convention centre. MPE's filter and capacitor solutions for vehicles were the big talking point.

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MPE APPLICATIONS

Filters for Ajax AFV training simulator

During 2016 the Marshall Aerospace and Defence Group was chosen to supply 25 new Ajax simulator shelters to Lockheed Martin. These mobile simulators will train turret crews on the British Army's Ajax, the new multi-role family of medium armoured fighting vehicles (AFVs) at the core of the British Army's deployable Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) capability. Integral to each of the three variants of the training simulator are custom EMP filters designed and manufactured by MPE. Following close liaison with Marshall during design and test, MPE has supplied quantities of two 63A three-phase custom filters.

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Custom feedthroughs for French Army

Through Euromip, its Silver-Certified territory partner for France, MPE has to date supplied almost 1,000 custom EMC feedthrough capacitors to Arquus, formerly Renault Trucks Défense, for its Sherpa Light family of 4×4 tactical and light armoured vehicles. These feature a payload up to 4.5 tonnes, a ground clearance of 0.6 metres and a high-torque 215 BHP engine. They include six variants from 7.9 to 10.9 tonnes, with the capability to transport 5-10 soldiers. MPE ensured that equipment systems such as wiper motors operated well within the limits defined by the French National Defence Standard GAM-EG-13.

Click for more details

FAST FACTS ON MPE LTD

- MPE has traded since 1925 and employs over 50 people.
- MPE has designed, manufactured and shipped in excess of 8,000,000 high-performance EMC, EMP and TEMPEST filters and feedthrough capacitors in the last 30 years.
- Many products have been in service for more than 20 years with undiminished performance.
- MPE has a portfolio of over 20,000 custom product designs to meet all possible requirements.
- The MPE factory at Knowsley, Liverpool, is certified to the quality standard ISO 9001:2015, and its products meet all applicable defence standards.

electronica

MPE Stand 131, Hall B6, at Electronica 2018

For comprehensive information about MPE's products and services, contact the Sales and Marketing Department, MPE Ltd, Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL, U.K.

Tel +44 (0)151 632 9100.

Email sales@mpe.co.uk. Website www.mpe.co.uk

If you have a friend or colleague who you think might find the MPE Company Bulletin informative, then why not forward it to them?

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Paul Currie – Sales & Marketing Director of MPE

The Institute of Directors HQ in Pall Mall, London

One of the five Finalists in 2018 for IoD Global Director of the Year

Institute of Directors recognition for Paul Currie

Throughout 2018 Paul Currie, the Sales and Marketing Director of MPE, has undertaken studies with the Institute of Directors (IoD). With headquarters in Pall Mall, London, and with a Royal Charter dating back to 1906, the IoD is regarded as Britain's most prestigious organisation for board level directors. With offices in all major cities across the UK, the IoD is a community of inspirational business leaders who strive to enable directors to develop both individually and as boards via accredited training and learning.

In early May of this year Paul completed studies toward his Certificate In Company Direction. Paul's studies were completed both remotely and residentially at the IoD's flagship Ashorne Hill training facility in Royal Leamington Spa.

Modules included: Leadership for Directors; Finance for Non-Financial Directors; the Director's Role in Strategy & Marketing; and the Role of the Director and the Board. They covered topics ranging from the UK corporate governance code to strategic market analysis and thinking. Following these studies, Paul successfully sat four separate examinations and attained his Certificate in Company Direction with distinction.

In late May Paul progressed to study for his Diploma in Developing Board Performance, completing his studies with a period of residential study during June at the IoD headquarters in Pall Mall. Subsequently Paul successfully sat his examination and in July was awarded the Diploma in Developing Board Performance, again with distinction. This accredited qualification was a SCQF Level 11, which is comparable to QCF and EQF Level 7 or Master's degree level.

Separate to these studies, Paul's leadership and direction were also recognised by the IoD as a Finalist in their prestigious 2018 awards, being nominated as one of only five Finalists in the Global Director of The Year category. The Awards dinner and presentation were hosted by the BBC TV and radio presenter Dan Walker in May at the Midland Hotel in the centre of Manchester.

Paul is now completing work towards his Chartered Director status with the IoD, which he hopes to achieve by the end of 2018.

IoD

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Steve Eginton

Spotlight on Steve Eginton

The company's Quality Manager since May 2013, Steve Eginton is responsible for and is the lead on all Quality-related, Health and Safety, and Environmental Management (ISO14001:2015) activities within MPE, handling the key area of customer approvals. Reporting direct to Managing Director David Seabury, Steve is responsible for CE marking compliance and facilitated the transition from ISO9000:2008 to ISO9000:2015 accreditation, which he now maintains by auditing all areas of the business on a monthly schedule.

One of Steve's primary functions is to ensure that MPE's expected ultra-high product quality standards are fulfilled and maintained. That entails his involvement in first article inspections on all new and custom designs, along with his regular audit of key manufacturing parameters such as fabrication tolerances, adherence to standard operating procedures, and paint spray thicknesses and viscosities.

Among most notable personal landmarks, during 2017 Steve undertook training from an external provider for his Six Sigma Green Belt certificate. For this he participated in theoretical training one day a week, whilst also completing practical project work on current applications at MPE. Steve duly attained his Green Belt in late 2017. This was in addition to his Level 2 NVQ Diploma in Business Improvement Techniques, gained at MPE in May 2014.

Having achieved these qualifications, Steve steered a continuous improvement project to examine MPE's capacitor winding operations, pinpointing where improvements and efficiencies might be achieved. The outcome was a significantly better utilisation of floor space and a reduction in set-up time of 28%. More recently he has addressed the rearrangement of Stores and Despatch, the most recent areas of major investment at MPE, and similarly raised operational efficiencies there.

From 2009 to 2013 Steve Eginton was a Quality Engineer in the rail industry. Before that he was Quality Manager at an aerospace subcontract company and Quality Assurance Engineer from 2002 to 2005 at Airbus UK in Broughton, Flintshire, conducting his Quality audits at Toulouse. His previous experience in Quality Assurance and Systems Engineering included positions at Marconi Communications and GEC Alsthom.

Earlier Steve secured a BSc Honours degree at Liverpool John Moores University and a range of HNC, NC and City and Guilds qualifications in Engineering and CADD at the former North-East Technical College in Liverpool.

Steve lives at Cressington, Liverpool. His hobbies and interests include travel around East Coast USA, supporting Everton FC as a season ticket holder, and enjoying concerts as well as classical ballet, comedies and musicals in the theatre. A keen walker, he has just completed a sponsored Alzheimer's Society Memory Walk in Liverpool.

Green Belt

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One of MPE's component stores prior to installation of automated carousel

New carousel after components neatly loaded

Using the keypad on the automated carousel

Operator accesses the required parts in a matter of seconds

MPE invests in automated carousel

As reported in Issue 15 of the Company Bulletin, during 2017 MPE again experienced significant growth, along with record-breaking export turnover, and across the last three years overall sales have risen by some 30%. Accordingly MPE has invested heavily in many areas of its business in Liverpool, in order to expand capacity to meet the growing demand for MPE products. In line with the company's continuous improvement strategy, the most recent areas to undergo major investment and expansion have been MPE's Stores and Despatch areas.

Whilst not always considered the most high-tech activities in MPE's business, the Stores and Despatch functions are crucial to meeting customers' needs around the world. Both operations have defined key performance indicators (KPIs), such as the percentage readiness of assemblies and on-time deliveries (OTD), all closely measured and actioned by MPE.

MPE's principal Stores and Despatch area covers some 150 m^2, and therefore space is not a constraint. Nevertheless, prior to the start of 2018, for legacy reasons MPE maintained several other Stores locations around its facility. This meant that efficiencies were possible by consolidation within processes such as the receipting of goods inward and kitting for assembly.

In Spring 2018 MPE embarked on a major project to maximise efficiencies and significantly increase its throughput capacity in this area.

Phase 1 of the project saw the rearrangement of Stores and Despatch to realise an efficient flow of goods inward, storage, kitting and despatch. That involved investment in new structures and office space, along with new roller shutter access. Phase 2 saw MPE bring all its Stores into a single location – with a major investment in a new, automated storage carousel.

This Electroclass Titan G60 carousel was installed at MPE at the beginning of July. It now enables the storage of some 140,000 components within a 20 m^2 footprint.

Previously, storage of the same components consumed a footprint some 20 times larger and across several disparate areas. The floorspace made available by the carousel now allows MPE to kit parts for orders four weeks in advance of assembly, whereas, before, parts could only be kitted for orders two weeks in advance of assembly. The automated retrieval of parts for kitting has also significantly reduced the time taken to kit the parts required to fulfil individual orders.

This new Stores and Despatch capability, with all locations and processes consolidated into a single area, sees MPE capable of fulfilling customer deliveries in the most efficient way for many years to come. This strategic advance has already realised benefits to the customer and been a contributory factor in the company increasing its on-time deliveries (OTD) by some 30% since the start of 2018.

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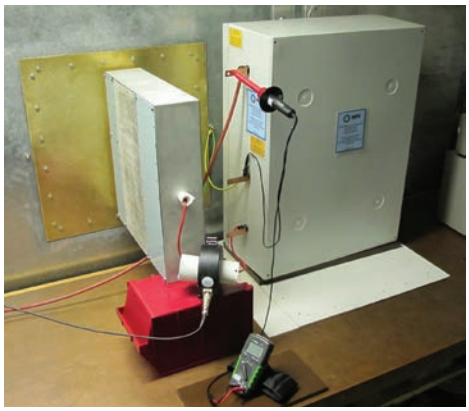
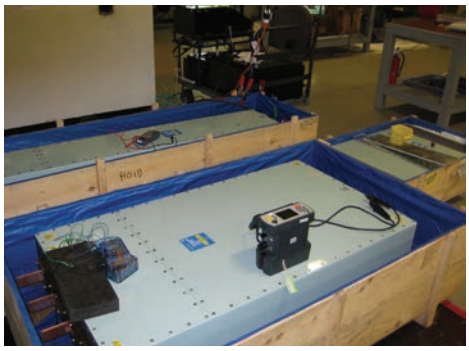


The Marx pulse generator installed within MPE's in-house screened room test facility



An MPE HEMP filter undergoing subsequent independent PCI testing in the USA

Examples of MPE's commercial HEMP filters

PCI compliance at first time of asking

The well-established procedure for checking compliance of a HEMP filter with the Mil-Std-188-125 specification is to inject a very high current pulse into the front end of the filter and monitor the residual current flowing through. Such pulse current injection (PCI) testing is conducted independently of the filter manufacturer, by trusted test houses utilising specialist and often proprietary equipment. No test house in Europe offers such commercial PCI testing, and filters are most commonly tested in the USA.

This PCI testing can only be carried out at the final stage of development and requires that a prototype filter be made to the same standard as a finished production filter would be. Hence it is vital that any HEMP filter design submitted for PCI testing passes first time, with no requirement for design modifications – which can add both significant cost and further time delays.

When designing new or custom HEMP filter variants, MPE's philosophy centres upon achieving the most efficient and rapid design, with the clear objective of minimising any changes necessary to achieve the required filter specification and performance.

Software modelling is at the core of this philosophy. Based upon the OrCAD PSpice electrical design platform, MPE has built up a library of parametric component designs which accurately replicate real world conditions. In developing these libraries, particular attention has been given to inductor core and capacitor winding materials and their voltage, current and frequency performance. Cabling and in particular insulation properties and characteristics are modelled to accurately reproduce filter performance.

Whilst not exactly replicating Mil-Std pulse waveforms, MPE has developed, in conjunction with the University of Liverpool, an in-house pulse test capability which provides an accurate representation of the Mil-Std E1 pulse for testing and optimising new and variant designs.

Accordingly the Marx pulse generator comprises an 8/20µs pulse tester for bulk current handling tests with a pulse current of up to 5kA, and a 5/200ns pulse tester for rise time checks. The energy content of the 8/20µs pulse is higher than the Mil-Std E1 pulse, but its rise time is much slower. The 5/200ns pulse demonstrates the speed of response of the system. The 8/20µs pulse is used with a view to meeting the E1 residual current limit of 10A.

These PSpice software modelling and in-house pulse testing capabilities provide MPE with a high degree of confidence that, during subsequent external PCI testing, any new or custom HEMP filter designs will meet the requirements of Mil-Std-188-125 without the need for design modification work.

These in-house design and test capabilities are proving invaluable for the successful supply of MPE's new and variant, commercial and modular, HEMP filter ranges for high-profile programs around the world.

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David Seabury, Managing Director of MPE (left), signs the distribution partner agreement in Liverpool with Susumu Matsuoka, President of Tokin EMC

The Tokin EMC stand at Techno-Frontier 2018 in Chiba City, Japan

MPE distribution expands into Japan

MPE is pleased to announce the appointment of the Tokin EMC Engineering Company Ltd (Tokin EMC) as its distributor for Japan from April 2018. As pictured here, the agreement was officially signed during Tokin's visit to MPE in Liverpool that month.

Founded in November 1983, Tokin EMC is part of the Tokin Corporation. Tokin EMC provides three distinct services – Measurement Services, System Services and EMC Solutions. MPE fits centrally within the EMC Solutions offering. Accordingly MPE's portfolio complements Tokin EMC's existing products, which range from individual absorbers and antennas through to complete shielded room solutions.

Headquartered in Kawasaki, Tokin EMC also has facilities in Osaka and Tsukuba, with its locations in all three cities boasting impressive, 10-metre anechoic test chamber facilities. Tokin also benefits from an existing and longstanding trading relationship with Eretec Inc, MPE's Gold Partner for the Republic of South Korea.

Over recent years MPE has seen an organic increase in interest and sales of filters to Japan and has recognised for some time that a strong distribution partner was needed for Japan, in order to realise further growth within the territory.

Paul Currie, MPE Sales & Marketing Director, commented on the appointment: "The introduction of MPE's Partner Program in 2017 has enabled MPE to demonstrate clear expectations to prospective new distributors and ensure that they may fit easily within the existing family of MPE distribution partners. In Tokin EMC I am confident that MPE has found a partner with whom we can successfully work for many years to come."

Mr Susumu Matsuoka, President of Tokin EMC, commented: "With the growing awareness of the EMP threat coupled with the growth in EMC activity within Japan, Tokin EMC has been keen to source a supplier of quality EMC and EMP filters for some time.

"The addition of MPE is key to our business going forward and positions Tokin EMC at the very forefront of the emerging EMC and EMP markets."

In April Tokin EMC exhibited their product solutions and services at the annual Techno-Frontier trade show held at the Makuhari Messe in Chiba City, Tokyo Bay. Over the three days of this, the largest EMC event held in Japan, Tokin EMC showcased their new EMP rack solution which incorporates MPE's ground-breaking HEMP filter range.

TOKIN

For EMC product enquiries in the Japanese market, email matsuokas@tee.tokin.jp or visit the Tokin web pages www.tee.tokin.jp/eng

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Strongfield Technologies' stand at DefExpo India 2018

Strongfield Technologies receive their Bronze Partner award at DefExpo India: from left to right, John Jephcott of MPE, Neil Murthy & Vik Mongia of Strongfield

Fred Morelli of Euromip (left) with John Jephcott of MPE on the Euromip stand at Eurosatory 2018

MPE at DefExpo India & Eurosatory

Over four days in April MPE's Bronze Distribution Partner for India, Strongfield Technologies, exhibited at the tenth biennial DefExpo India in Chennai, opened by India's Prime Minister Narendra Modi. DefExpo India is one of the world's biggest defence exhibition and conference events. It covers land, naval and homeland security, and the USA, UK, Russia, France, Israel, South Korea and Sweden are among participating nations.

As regular exhibitors at DefExpo, Strongfield occupied a large stand space to showcase their principal offerings including MPE's range of EMC, EMP and TEMPEST filter solutions. In support of this, MPE Key Account Manager John Jephcott was on the stand to conduct meetings with established customers and new prospects. Throughout the event there was a high level of interest from system specifiers, consultants, installers and end-users alike.

During June MPE also supported its Silver Distribution Partner for France, Euromip, at the biennial Eurosatory, among more than 1800 exhibitors from 63 countries packing the Paris Nord Villepinte convention centre. So, following a very successful 2016 event, this was the second time that Euromip had exhibited at the Show, which has a specific focus on military vehicles.

The Euromip stand displayed their LED lighting solutions, alongside a good selection of MPE's filter and capacitor products for their numerous applications on defence vehicles. In support of this, John Jephcott was again in attendance. The Euromip stand was kept busy over the five days of the Show, and meetings were arranged with many parties involved in land defence supply chains, from France and other European territories.

John Jephcott summed up: "MPE was pleased to see two of its Distribution Partners exhibiting at such prestigious and successful events, and we were happy to extend our support to them. Both DefExpo India and Eurosatory provided ideal platforms to make face-to-face contact with a large number of visitors and notably afforded many business opportunities for our Partners to follow up."

2018 EUROSATORY 11 - 15 JUNE 2018 / PARIS

defexpo 2018 India The Emerging Defence Manufacturing Hub DEFEXPO 18 INDIA 11-14 APRIL 2018 CHENNAI Ministry of Defence

Silver Partner

EUROMIP

Bronze Partner

Strongfield TECHNOLOGIES

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One of Marshall's turret crew training simulators for the Ajax AFV

An MPE EMP powerline filter

The British Army's Ajax fighting vehicle

Filters for Ajax AFV training simulator

During 2016 the Marshall Aerospace and Defence Group was chosen to supply 25 new Ajax simulator shelters to Lockheed Martin. The simulators will facilitate the training of turret crews on the British Army's Ajax, the new multi-role family of medium armoured fighting vehicles (AFVs) designed to be the medium weight core of the British Army's deployable Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) capability.

The primary role of Ajax is to provide accurate and timely information to support decisionmaking at all levels, providing commanders with a survivable and capable Ground Mounted Manned Reconnaissance (GMMR) platform, which gives them the flexibility to perform a range of roles across the spectrum of conflict.

This is in support of a contract received by Lockheed Martin from General Dynamics Land Systems-UK, who are responsible for delivery of the Ajax simulator capability and service contract to the UK Ministry of Defence.

There are three variants of the training simulator:

- The Crew Turret Trainer (CTT), which provides a high-fidelity replica of the turret, complete with controls and high-definition imaging.
- The Appended Trainer (AT), which incorporates a full computing facility, generating the imagery for injection into an actual Ajax turret and giving students the ability to train inside their own vehicle.
- The Performance After Action Review (PAAR) module, which provides facilities for trainers to completely re-run the exercise and further develop students' skills.

Integral to each simulator shelter variant are customised EMP filters designed and manufactured by MPE.

Following extensive engagement and testing with Marshall during the design stage, MPE developed two 63A three-phase custom filters. These custom filters are designed to ensure EMP integrity and protection for each simulator shelter.

Marshall has now delivered the first batch of shelters, which have been used to prove the system capability, and to date MPE has manufactured and supplied 26 custom filters to support this. The follow-on units will be delivered over the next 12 months, giving the British Army the freedom to move them to wherever they are required, rather than having to bring troops to fixed locations. MPE will again be manufacturing filters throughout this period in support of the delivery phase.

This is the second contract that Marshall has won for training systems for Ajax, having also been selected to provide cabins for the driver training simulators.

Marshall

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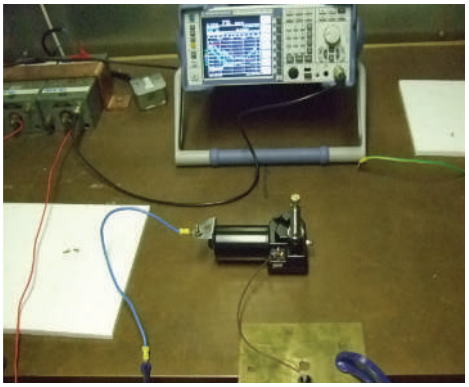
The Renault Sherpa Light tactical vehicle for all-terrain mobility



Pre-compliance testing at MPE in Liverpool

Typical examples of MPE feedthrough capacitors

Custom feedthroughs for French Army

Through Euromip, its Silver-Certified territory partner for France, MPE has been supplying EMC filters to Arquus, formerly Renault Trucks Défense, since 2010. Arquus has a worldwide presence, having partnerships with multinational groups such as MBDA, Nexter and Thales and boasting five production sites and 1500 employees in France. The Arquus range includes light, medium and heavy, wheeled military vehicles for combat, tactical and logistics operations.

The French Army are major users, with 90% of their wheeled vehicles being supplied by Arquus. The Sherpa Light range is one such example.

The Sherpa Light family of 4×4 tactical and light armoured vehicles have been designed to meet the needs of light forces (infantry, paratroopers, marines and internal security) in respect of all-terrain mobility, payload and protection. The Sherpa Light benefits from a huge payload (up to 4.5 tonnes), a ground clearance of 0.6 metres and a high-torque 215 BHP engine. The Sherpa family includes six variants from 7.9 to 10.9 tonnes, with the capability to transport between five and ten soldiers.

During the design phase of the Sherpa Light platform, MPE was consulted to ensure that both EMC compliance and operational EMC performance requirements were fully met. Following initial consultation, MPE conducted pre-compliance testing in order to diagnose specific areas of issue and design the most effective filtering solutions. A particular focus was on the limits defined in the French GAM-EG 13 A1 specification, ensuring that equipment systems such as wiper motors operated well within them.

Subsequently MPE produced and supplied a range of custom feedthrough products to Arquus for installation on its Sherpa Light vehicles prior to full approval testing.

Each MPE feedthrough capacitor was optimised for a particular application within a specific area of the vehicle. The MPE feedthroughs represent critical components within the Sherpa Light vehicles, and to date almost 1,000 of these custom MPE products have been manufactured and supplied via Euromip (www.euromip.com) to Arquus.

Looking ahead, MPE's strong supply relationship with Arquus is set to continue for many years, since, in addition to its current use with the French Army, the Sherpa Light has also now been successfully promoted to, and ordered by, other NATO member forces.

For more details of MPE's high-performance feedthroughs, go to:
www.mpe.co.uk/category/feedthroughs

Silver Partner

EUROMIP

ARQUUS