MPE 95TH ANNIVERSARY 1925-2020

# Company Bulletin

for EMC, EMP, HEMP & TEMPEST Protection

Issue 23

## MPE PEOPLE

### ISO9001 & Cyber Essentials certification

**Following successful audits, MPE has achieved the renewal of its ISO9001 and Cyber Essentials certifications, maintaining ISO9001 continuously for over 35 years . . . . Read More >**

### Spotlight on Steve Cunningham

**Steve Cunningham, Assembly & Training Manager, supervises various areas of production, assembly and metal finishing on a daily basis as well as the training of apprentices . . . . Read More >**

## MPE ACTIVITY & TECHNOLOGY

### MPE granted varistor patents for UK & Europe

**MPE has been granted approval in the UK and Europe for two new patent families covering varistor transient suppression technology to tackle incoming electromagnetic pulse . . . . Read More >**

### MPE TEMPEST filters assigned NATO Stock Nos

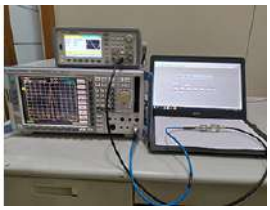
**All MPE TEMPEST filters have now been assigned unique NATO Stock Numbers, for NATO organisations to reference and use in line with NATO Standardisation Agreements . . . . Read More >**

## MPE DISTRIBUTORS

### MPE appoints UK distributor for the first time

**SACA Group Ltd, appointed as MPE's authorised distribution partner for the UK on September 1st, is wholly independent of MPE whilst sharing the same address in Liverpool . . . . Read More >**

### EMtrek tests MPE's ceramic filters in Taiwan



**EMtrek, MPE's distributor in Taiwan, has built a testbed to demonstrate to their customer the performance of MPE's MSK range of miniature ceramic feedthrough filters . . . . Read More >**

## MPE APPLICATIONS

### HEMP filters for Clear AFB power plant in Alaska

**MPE has manufactured a suite of high-performance HEMP filters, ranging from 32A to 400A current ratings, for the power plant of a USAF radar station in Alaska . . . . Read More >**

### MPE confirmed world no.1 for telephone line filters

**MPE has fulfilled a unique contract for fifteen 240-line telephone filter units, each unit comprising ten 24-line modules of 12 high-symmetry, matched pair circuits . . . . Read More >**

## FAST FACTS ON MPE LTD

- Trading for over 95 years, MPE employs more than 60 people.
- MPE has designed and manufactured in excess of 10,000,000 high performance protection filters and feedthrough capacitors across the last 30 years.
- Many products in continuous service for more than 25 years.
- MPE's portfolio spans over 20,000 custom designs.
- MPE is certified to the ISO 9001:2015 quality standard, and its products meet all applicable defence, safety and regulatory standards.

Product returns rate 0.012%

**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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bsi.

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that: MPE Limited
Filters and Capacitors
Hammond Road
Knowsley Industrial Estate
Liverpool
L33 7UL
United Kingdom

Holds Certificate Number: FM 00699

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

The design and manufacture of: Filters: RFI, powerline, telephone, data line, control line, EMP, EMC, ceramic, EMP modules. PF compensating chokes, pulse forming networks, suppressors. Fixed capacitors: mica, paper, plastic, ceramic multi-layer. Custom surge suppression replacement kits, chokes. The provision of test facilities for conducted interference testing.

For and on behalf of BSI: Andrew Launn, EMEA Systems Certification Director

Original Registration Date: 1986-06-02 Effective Date: 2020-08-14
Latest Revision Date: 2020-06-23 Expiry Date: 2023-08-13

Page: 1 of 1

...making excellence a habit.

bsi. ISO 9001 Quality Management

FM00699


CYBER ESSENTIALS

CERTIFICATE OF ASSURANCE

MPE Limited

Hammond Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UL

COMPLIES WITH THE REQUIREMENTS OF THE CYBER ESSENTIALS SCHEME

NAME OF ASSESSOR: Damian Walton

CERTIFICATE NUMBER: IASME-CE-002514

DATE OF CERTIFICATION: 2020-7-20

PROFILE VERSION: February 2017

RECERTIFICATION DUE: 2021-7-20

SCOPE: Whole Company

CERTIFICATION MARK CERTIFICATION BODY CYBER ESSENTIALS PARTNER

IntaForensics IASME CONSORTIUM

CYBER ESSENTIALS CERTIFIED

## ISO9001 & Cyber Essentials certification

**ISO9001:2015**

Following the successful conclusion of its latest audit, in August 2020 MPE Ltd achieved the renewal of the company's ISO9001:2015 certification.

Having first secured ISO9001 in June 1986, MPE has now maintained uninterrupted ISO9001 certification for over 35 years, the renewed certification being effective through to August 2023.

As part of ISO9001:2015 requirements, MPE receives a regular six-monthly audit conducted by BSI. Each audit consists of a comprehensive appraisal of MPE's activities – from shopfloor processes and systems for product manufacturing and testing through to staff training plans and MPE's management of risk.

Whilst every previous audit has comprised a day-long physical visit by BSI, owing to the current Covid-19 restrictions this most recent audit was a new experience, since it had to be conducted virtually.

Your link to download MPE's ISO9001:2015 certificate is: https://www.mpe.co.uk/wp-content/uploads/2020/07/ISO9001-Certificate-14th-August-2020.pdf

**Cyber Essentials**

In July 2020 MPE attained its renewed Cyber Essentials certification to confirm the robustness of the company's data and IT systems and their safeguards against online security threats.

The UK Government has worked with the Information Assurance for Small and Medium Enterprises (the IASME Consortium) and the Information Security Forum (ISF) to develop Cyber Essentials, a set of technical controls to help organisations protect themselves against common online threats. The scheme is backed by industry partners including the Federation of Small Businesses, the CBI and a number of insurance providers. In fact the Government now requires all suppliers bidding for contracts involving the handling of certain types of sensitive information to be certified In accordance with the Cyber Essentials scheme.

Accordingly the annual assessment phase examined every piece of IT equipment at MPE, all IT security, malware and antivirus software in use at the company, and the robustness and policing of all of its IT processes. MPE was proud to have again achieved 100% compliance in this assessment.

The certification provides reassurance to clients that MPE has taken the appropriate steps to secure its IT systems against future cyber attack and proves MPE's commitment to protecting its own and its customers' data. Your hyperlink to MPE's Cyber Essentials certificate is: https://www.mpe.co.uk/wp-content/uploads/2020/07/Cyber-Essentials-Certificate-2020.pdf

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Steve Cunningham



The Do Drop Inn pop-up pub in Steve's garden

## Spotlight on Steve Cunningham

Steve Cunningham, Assembly & Training Manager, first joined MPE in July 2011 as Manufacturing Supervisor. Reporting to Marcus Wright, Manufacturing Manager, Steve now supervises various areas of production, assembly and metal finishing on a daily basis.

They include all of the assembly operations, the paint spray room and dielectric resin filling for capacitor performance. As Training Manager, Steve is also fully responsible for the induction, training and supervision of MPE's apprentices. Furthermore he is active in the recruitment and interview of both new apprentices and new recruits to the Manufacturing team at MPE.

Steve Cunningham's career path reflects his immense experience in supervisory roles. For 18 years from 1993 to 2011 he worked his way up steadily from the shopfloor to become the Assembly Supervisor for the Stoves Group in Prescot, Merseyside, a contract manufacturer of domestic ovens for a number of major UK brands.

Between 1981 and the end of 1992 Steve was Transport Yard Foreman for the haulage and storage company T&S Northern at Prescot. There he was responsible for logistics and shipments including stocktaking, timeslot allocations and verifying loads against manifests.

Steve was educated at St Edmund Arrowsmith High School in Whiston, Merseyside, subsequently acquiring his NVQ qualifications in Supervision and Management at college. In fact he lives at Whiston with his wife, and they have sons aged 29 and 34.

His passion is travelling with his wife in their campervan all around the UK, to discover the hidden gems of small town Britain – as well as for some serious country walking. In 2018 the two of them walked the Yorkshire Three Peaks Challenge of Pen-y-Ghent, Whernside and Ingleborough in less than 10 hours. Previously he had scaled Ben Nevis, Snowdon and Scafell Pike in an actual climbing time of 14 hours.

In his younger days, Steve played non-league soccer in the St Helens & District Football Combination and Liverpool County Football Combination and secured coaching badges from the Football Association at Wembley. He has been a lifetime supporter, too, of Liverpool FC.

Of great topical interest, as an initiative during the national Covid-19 lockdown, Steve has been running a "Do Drop Inn" pub for family and friends, which he has constructed in his back garden whilst accommodating social distancing. The installation is complete with keg beer and beer pumps for dispense. Pictures of Steve's "Do Drop Inn" pub are shown on the left.

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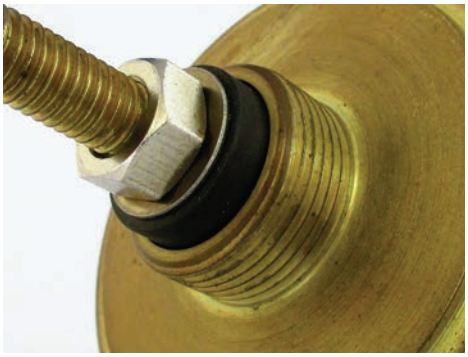

Novel varistor research at MPE culminates in world-beating patents


Standard MPE 6A High-Altitude Electromagnetic Pulse (HEMP) filter for protecting incoming power lines

## MPE granted varistor patents for UK & Europe

As previously reported in Issue 17 of the Company Bulletin, in early 2015 MPE initiated an intensive research programme into transient suppression techniques for arresting incoming energy pulses.

One outcome of this pathfinding research was a patent application by MPE in 2018 for two families of patents to cover the UK, Europe and the USA.

Following an intensive period of independent review conducted by the relevant intellectual property offices for those regions, and with the expiry of regulatory time periods, in July 2019 MPE was granted approval for these two patent families in the UK and Europe.

The first family of patents granted (GB1600953.2, WO2017125725, EP3405963 and US16/071,193) relates to MPE's latest feedthrough varistor system, which has a thermally activated override.

Speed is of the essence in protecting against incoming pulses. This new product not only dramatically increases switch-on speed by reducing circuit inductance, but also provides a safe and complete disconnection of the system from the circuit in the event of the varistor degrading.

The second family of patents granted (GB1600953.2, WO2017125724, EP(DE)3384509 and US16/071,179) relates to a varistor system that can be integrated into many types of power cord or plug. It enables retrofit or additional electromagnetic pulse (EMP) protection to be added to virtually any device simply by changing the power plug or cord to that device.

Both products can be used in EMP and directed energy protection devices, and MPE is now completing all necessary research and development work, so as to fully introduce these breakthrough technologies into the EMP filter solutions it manufactures on a regular basis.

As the next step, following successful prosecution through the international phase of the Patent Cooperation Treaty (PCT) which resulted in wholly favourable examination reports being issued, MPE expects to obtain granted patents for both patent families in the USA, too, within the next 12 months.

All of this will ensure that the company remains a world leader for years to come in the critical area of varistor transient suppression technology for electromagnetic pulse.

Intellectual Property Office

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An example of a 16A MPE TEMPEST power line filter with customised mounting

Pluggable TEMPEST filters from MPE

An array of MPE TEMPEST EMI filters in a tactical shelter

A low-leakage MPE TEMPEST power line filter for the Royal Navy

## MPE TEMPEST filters assigned NATO Stock Numbers

All of MPE's TEMPEST filter products have now been assigned NATO Stock Numbers, unique codes for NATO organisations to reference and use.

Filters for TEMPEST – often regarded as an acronym for "Transient ElectroMagnetic Pulse Emanation Standard" – are countermeasures aimed at preventing eavesdropping on data radiated as signals via conducting lines (such as power, telephone or control line cables). These unintended electromagnetic emanations can be intercepted by hostile intelligence services operating outside the boundary of an enclosure, cabin, building or room and reconstructed by them as intelligible data.

A NATO Stock Number, or National Stock Number (NSN) as it is known in the US and UK, is a 13-digit numeric code, identifying all the "standardised material items of supply" recognised by the 29 NATO member countries including the United States Department of Defense.

In line with NATO Standardisation Agreements (STANAGs), the NSN has come to be used in all treaty countries. Furthermore, many other countries who are not members of NATO, such as Japan, Australia and New Zealand, have adopted the NSN program.

The STANAG Agreement defines processes, terms and conditions for common military and technical procedures and equipment between the member countries of the alliance. Each NATO state ratifies a STANAG and implements it within their own military. The purpose is to provide common operational and administrative systems and logistics, so that one member nation's military may use the stores and support of that of another member.

So this important assigning of NATO Stock Numbers to the entire range of MPE TEMPEST filters is a testament to their world-leading status and their maturity, performance and reliability in a host of army, navy and air force applications. The safeguarding of command-and-control operations, tactical communications and ground stations from ever more sophisticated covert interrogation remains an essential part of defence in the 21st Century.

All the filter components are manufactured and tested at the MPE factory in Liverpool under a stringent ISO 9001 quality regime. And with many thousands of MPE TEMPEST filters currently in service around the world, reliability over long service has become their hallmark.

MPE offers a comprehensive range of TEMPEST power line filters of alternative performance specifications. These extend from 6A to 16A filters, which might be used to treat individual power inlets, up to 3000A filters for the hardening of a main building power supply.

MPE has over several decades supplied TEMPEST products which adhere to the onerous specifications of CESG (the Communications Electronics Security Group at GCHQ) and of the US National Security Agency (NSA) and more recently NATO TEMPEST SDIP-27 and SDIP-29 Standards.

For comprehensive information on MPE's TEMPEST protection filters, please look up www.mpe.co.uk/category/tempest

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Cemal Alpay – Managing Director, SACA Group Ltd

Armin Maghami – Field Sales Engineer, SACA Group Ltd

## MPE appoints UK distributor for the first time

For the first time in its trading history, MPE has appointed an authorised distributor for supplying its products to the UK market. SACA Group Ltd was appointed as an authorised distribution partner for the UK on 1st September 2020.

This appointment is a direct result of the rising levels of business MPE has experienced from its home market and the growing number of clients whom MPE is supplying.

Historically MPE has successfully traded with its UK clients directly. Given the number of clients and projects demanding MPE product solutions, this mode of operation has worked well for many years. However, by natural process over the past five years, MPE has seen its UK business increase exponentially, with the number of UK clients ordering its unique EMC and EMP filters and capacitors now running into many hundreds.

Being essentially a world-class design and manufacturing organisation, MPE's direct sales strategy has therefore become increasingly difficult to sustain and support, and for this reason MPE has now migrated to the same successful distribution model as it employs around the globe.

MPE will continue to supply direct its authorised distribution partners worldwide as well as major project integrators in the UK. But clients whose requirements are smaller in scale, or of a more occasional nature, will now be supplied through SACA Group Ltd.

SACA Group Ltd is a UK-registered company, has common ownership and shares the same management team as SACA Europe BV at Helmond in The Netherlands. Staffed by trained engineers with degree qualifications, the Group boasts 32 years' accumulated experience and expertise in electronics component distribution. SACA Europe is already an authorised MPE distribution partner, successfully supplying MPE's EMC and EMP filter and capacitor solutions to Bulgaria, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Romania, Slovakia and Slovenia.

Whilst MPE and the SACA Group are wholly independent of each other, SACA UK will conveniently be based at the same address as MPE in Knowsley, Liverpool. By shortening the lines of communication, this co-location will maximise the speed and efficiency of response to sales enquiries and technical questions and of subsequent product supply to the UK market. Furthermore any requirements for custom solutions can be discussed with MPE experts on the spot and without delay.

Alongside MPE's full product range, SACA Group Ltd in the UK is also the authorised UK distributor for EMI Solutions Inc, Konnect RF and Netzer Precision Motor Sensors.

For information on SACA UK, go to www.sacauk.com or contact their team on +44 (0)151 632 9190 or via email info@sacauk.com

saca uk

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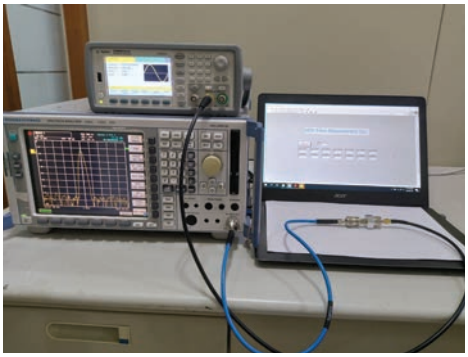
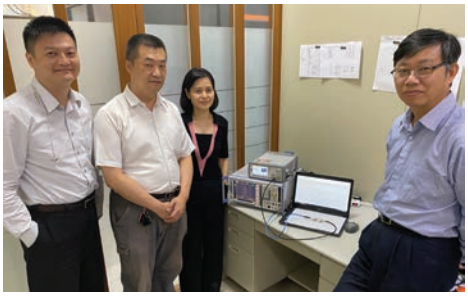


The arrangement of the test bench for demonstrating the performance of MPE's MSK range of miniature ceramic feedthrough filters



The EMtrek project team, from left to right, Smile Lin (Vice-President, Sales and Marketing), Leo Ho (Executive Specialist), Sylvia Huang (Senior Account Sales) and Richard Liu (General Manager of EMtrek and WavePro).

## EMtrek tests MPE's ceramic filters in Taiwan

Despite the challenges posed by the Covid-19 pandemic, MPE has been robustly protecting and maintaining its business in the Far East, with a recent focus on Taiwan in particular. Working closely with its exclusive distributor for Taiwan, EMtrek Technologies Corporation of Dashi Town, Taoyuan County, MPE has been busy manufacturing and supplying quantities of its legacy ceramic filter and feedthrough filter ranges.

EMtrek Technologies have a team of 35 specialists – including four experienced field sales engineers – and have been designing and producing integrated EM test systems, from 200 MHz VHF communications frequency now up to 950 GHz, in Taiwan since 1993. They supply high-technology, complementary products, offering cutting-edge solutions from proven and established manufacturers to a well-established client base active in the areas of defence, satellite and 5G New Radio (5G NR) communications, education and industry.

In particular they dominate the market for antenna test systems, having built more than 200 worldwide, and command a market-leading share of over 80% for the supply of antenna test chambers within university and college education.

Calling upon this expertise, in June 2020 EMtrek were contracted to construct a testbed that would demonstrate the performance of MPE's MSK range of miniature ceramic feedthrough filters.

Comprising various signal generators and controlled via LabView software, response was critically analysed across the full frequency spectrum, with these tests being witnessed at first hand by EMtrek's customer. Following the successful conclusion of the testing and having fully satisfied their client, EMtrek went on to assist the customer's quality control department, advising on how to set up a similar EMC test bench for further production volumes.

Paul Currie, Sales and Marketing Director of MPE Ltd, remarks: "Having worked previously with EMtrek on a number of Electromagnetic Pulse (EMP) projects, it has been great to expand business into the ceramic and feedthrough areas. MPE's quality and reliability, coupled with EMtrek's technical capability and established track record, have proved yet again to be a winning combination."

Richard Liu, General Manager of EMtrek, comments: "MPE's advice and assistance ensured that the test set-up and testing process were completed without any major issues, so that our client was fully satisfied. I am confident that this continued collaboration will lead to further increases in business for MPE's products within Taiwan."

For details of EMtrek Technologies Corporation, check out www.emtrek.com.tw or call their enquiry hotline +886-3307-1256.

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Views of Clear Air Force Base in Alaska

MPE HEMP power line filters of different amperages


Left to right: Terry Murch – TSS, Tom Griffin – TSS, Paul Currie – MPE and David Seabury – MPE

## HEMP filters for Clear AFB power plant in Alaska

After a lengthy and often challenging period, MPE has manufactured and supplied via its Silver territory distribution partner Technical Sales Solutions (TSS) and systems integrator ATEC Shielding LLC (ATEC) of Elkridge, Maryland, USA a suite of high-performance HEMP filters for installation within Clear Air Force Base, located in Denali Borough, Alaska.

In conjunction with TSS, Paul Currie, Director of MPE, first travelled to Clear AFB in July 2015, meeting with representatives from both the US Air Force (USAF) and the US Missile Defence Agency (MDA). Following this initial meeting, a lengthy period of design proving, testing and reliability evidence provision was completed by MPE, ensuring that the MPE solutions fully met the requirements of the site, the MDA, the US Army Corp of Engineers (USACE) and the USAF.

Ultimately the MPE solutions supplied met the demanding performance specification flowed down from Clear AFB. Specifically, requirements included not only compliance with the current Mil-Std-188-125 but also compliance with UL1283.

Additionally, compliance with the USACE filter test specification, section 13 27 54.03, filter section 2.5, paragraph 2.5.5, as well as the United States Department of Defence (DoD) Unified Facilities Guide Specification (UFGS) 13.49.20.03, filter section 2.7, paragraph 2.7.5, was called for which required that additional testing be conducted in the USA, as previously reported in Issue 15 of the MPE Company Bulletin. Further to this, the MPE filters had to be independently evaluated and rated for seismic survivability.

Following installation by ATEC, the HEMP solutions supplied are used to harden the site's power plant, with this being referred to as "Special Protection Measures". The primary power brought into the power plant is then conducted back out of the shielded volume to power chillers, heating systems and site-wide power requirements. The MPE filters supplied are of a modular construction and include both 2-line and 4-line variants, ranging from 32A through to 400A current ratings.

Further details of MPE's modular HEMP filter range can be found at: www.mpe.co.uk/downloads/hemp-filter-datasheets/. More information on Technical Sales Solutions (TSS), MPE's Silver distribution partner for the USA, is obtainable from www.techsalesolutions.com or by emailing Terry Murch at TSS, terry@techsalesolutions.com

**Silver Partner**

tss Technical Sales Solutions

ATEC SHIELDING

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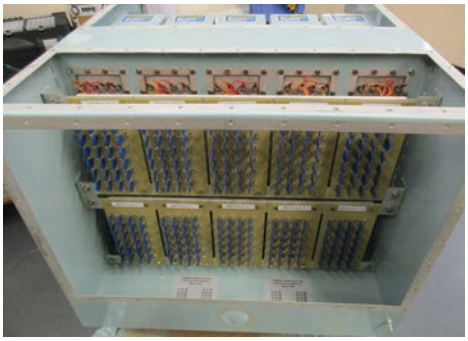
24-line modules prior to their assembly within finished units at MPE

The outer steel enclosure during MPE's in-house paint spray process



A 240-line unit (10 modules of 24 lines each) with varistor PCBs fitted

## MPE confirmed as world no.1 for telephone line filters

Following a period of extensive, iterative design, in late 2019 MPE was awarded a major contract to supply telephone line filters for a northern European program. This contract award represented the largest single order for telephone line filters in MPE's long history.

MPE has the longest documented track record of supplying these filters for both the defence and commercial markets. In fact MPE boasts the most extensive catalogue range of any manufacturer around the globe, with variants ranging from 2-line through to 240-line units.

The new contract award saw MPE manufacture fifteen 240-line telephone filter units. Each 240-line filter comprised ten 24-line modules, with each module in turn containing twelve high-symmetry, matched pair circuits. Every filter unit provided an insertion loss performance exceeding 100dB attenuation (50Ω system) and extending beyond 10GHz. MPE's self-healing capacitor technology was used throughout: each line was equipped with varistor transient suppression, and the units were CE compliant.

The production of such telephone line filters is notoriously difficult because of the capacitance values and the tight matching tolerances required to ensure that all lines are balanced. Totalling some 3,600 lines of filtering, such a filter requirement constituted one of the greatest manufacturing challenges that MPE has encountered over the past few years.

Despite production coinciding with the height of the Covid-19 pandemic in the UK and MPE having to adjust to staff isolations and new working practices, all 15 filter units were supplied during April, May and July, with the contract being completed right on time and to schedule.

The fulfilment of this order further confirms MPE's position as the world's number one provider of telephone line filters.

You can download your copy of MPE's telephone line filter catalogue via the following link: www.mpe.co.uk/wp-content/uploads/2015/11/Telephone-Line-Filter-Catalogue-Issue-8.pdf