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# desider

**Issue 151**  
**March 2021**

*the magazine for  
defence equipment  
and support*



**Innovation Edition**





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# Foreword

By Sir Simon Bollom, CEO



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**We must be  
bold in utilising  
unconventional  
methods in what we  
are delivering and  
how we deliver it.**  
— ” —

In this edition of Desider, you will see a gamut of the most innovative projects across DE&S as we continue to harness emerging technologies and develop battle-winning capabilities.

Over the last 12-months, DE&S has demonstrated our agility and just how much can be achieved when supporting Defence critical outputs – as well as wider government taskings – in extreme circumstances.

Through discipline and ingenuity, we have adapted brilliantly in the face of COVID-19 and demonstrated resilience and dedication. These same characteristics are needed when considering novel and innovative ways of delivering the very best for our armed forces.

The announcement of the £16.5-billion four-year settlement is a fantastic boost for defence and provides the means to modernise and equip for the threats and opportunities of a rapidly changing world. We await the imminent Integrated Review (IR) that will undoubtedly determine our future direction and how we equip and support the UK's armed forces in operations now and in the future. This will also present an opportunity for DE&S to build on our successful 'COVID campaign' and reconfigure and focus on the new programmes and capability requirements.

The IR will likely illustrate that now, more than ever, the threat from our adversaries is diversifying. To combat this effectively, we must strive to accelerate innovations from idea to solution. We must be bold in utilising unconventional methods in what we are delivering and how we deliver it.

On page 8 you will read about the DE&S Buy And Try at Scale (BATS) commercial model that is channelling just that: a fast-paced commercial process that eliminates inefficiencies and

delivers the very best equipment and support straight into the hands of the user in much quicker timescales.

We are starting to build a strong culture of innovation, placing it at the centre of our organisation. We must keep pace with the modern world by adapting to new ways of working, new technologies, and securing access to the right talent and skills.

This brings me to highlighting our fantastic DE&S apprentices who we recently celebrated during National Apprenticeship Week. I am extremely proud of our apprenticeship scheme and it was great to gain insight into their valuable cross-function experience and hear of their involvement working on some of our most complex projects.

Looking to the future it is important to remember that no matter the challenges we've faced – this year and in previous years – we've continued to develop as an organisation and move in the right direction. I am looking forward to the challenges ahead and the continuous evolution of Defence.



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## On the cover

Clockwise from top left:

Army Warfighting Experiment 2020, Westdown Camp, Salisbury Plain (Jack Eckersley)

Soldier testing UAV's being trialled at Copehill Down (Beth Squire)

Army Warfighting Experiment 2020, Westdown Camp, Salisbury Plain (Jack Eckersley)

Sailors launch a Remus autonomous underwater vehicle (LA Phot Nicky Wilson)



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jobs in Glasgow



## Simon Dakin, Director Integrated Battlespace, on exploiting innovation

I believe that we are all innovative by nature. It is human nature to find imaginative ways of doing things better. In the context of defence equipment, it is easy to consider innovation as being focused on new, cutting-edge technology. But we must also think about innovation in how we do business and the way we think. For example, the COVID-19 pandemic has required all of us to think innovatively about how we conduct our everyday lives. So I am going to talk about three things: innovation in battlespace technology, our business methods, and our own thinking. Our adversaries are good at this, deploying technology in new and creative methods. We must be even better.

There are numerous examples across DE&S where people and teams are exploring innovative, world-leading technologies and striving to deliver new capabilities to our front-line customers – the armed forces. Some of these game-changing technologies are developed as bespoke products for our military users, but increasingly we are harnessing technology developed for a wider civil market and finding innovative ways to exploit it in the military battlespace.

From my own experience working with colleagues across DE&S, I am frequently delighted and fascinated by the plethora of exemplars – from robotic autonomous vehicles and digital twins to augmented reality and modularity. The list goes on. While it is wonderful to see these innovative ideas germinate in various pockets around DE&S, I am extremely keen to encourage people to share these ideas and discoveries across our business and bridge the gap to operational exploitation, at pace, with our military users.

In terms of business processes and methods, we should all be looking to consider and explore new approaches. Again, I have seen many great examples across DE&S where people are adopting innovative ways to deliver and support military equipment. For example, rapid application development, use of agile methodology, big data analytics or Robotic Process Automation. As with the technology theme above, many of these methods have been developed and applied at scale in the civil markets, from social media platforms and banking, or indeed with other government departments. We should all be looking to learn from the best and strive to improve our processes and methods, both in our business and the battlespace.

Having touched on innovation in technology and methods, my final topic focuses on our own thinking. The last year has required all of us to think innovatively about how we conduct our everyday lives. We have had to review how we engage with our work and our teams, how we embrace alternative technology and applications to conduct business remotely and, critically, how we look after our own wellbeing and that of our friends and families. Sometimes it is these forced and challenging situations which drive our most innovative and creative thinking. Despite the demands, I have been hugely impressed by the ingenuity and determination of people across DE&S to find new, different ways of not just coping, but providing the equipment and support required for our front-line military users who continue to engage on critical operations around the world. This could not

have been achieved without some seriously impressive adaptations by people across our business, who have continued to support our customers, often in ingenious ways. Some of these changes may have developed through deliberate thinking, but perhaps sometimes they are just subconscious adjustments to our known ways of working.

I return to my original theme, that we are all innovative by nature. I encourage everyone to take time to think about how you conduct business and everyday life now, and how you can make further improvements by doing things differently in future.

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## Defence Innovation - views from the key players



**Vice Chief of  
Defence Staff,  
Admiral Tim  
Fraser CB ADC**

While there are countless lessons that will be taken from the global pandemic, it is clear our ability to find ingenious, practical and timely solutions to the most challenging problems has been key. In defence we have played an important support role in the national response to the pandemic, while continuing to focus on how we get ahead of our potential adversaries.

We are at a pivotal moment with the announcement of the multi-year settlement for defence, which includes an increased investment on military research and development. This new investment must be harnessed to accelerate next generation technology and capabilities into the hands of our armed forces, enabling them to tackle current and future threats.

One area of particular interest will be Space, and our assured access to it will be fundamental. The threat from adversaries in this maturing domain is real and a step change in our approach is required. The growth of the Space industry and the rapid acceleration of technology means Space offers even greater opportunities for enhanced capability through innovation. We have a fertile, capable and enthusiastic baseline from which to spring forward.

DE&S continues to exploit this innovation ecosystem in novel ways, contributing significantly to the modernisation of defence. Including the agile contractual framework: Buy And Try At Scale (BATS). BATS drives small scale procurement at pace, putting products into the hands of the end user to test, iterate and refine the requirement, ensuring optimal capability.

DE&S has also played a pivotal role in the delivery of the Digital Twin project. The concept of a digital twin effectively means a dynamic digital representation of any part, system or organisation. The concept will provide a medium in the defence sector to collaborate on the development of a capability and then support it as it evolves through its lifecycle. On the Tempest programme, it is being used to design, test and support every single system and structure. What we can achieve now in days, traditionally, would have taken months.

Over the last year we adapted in ways we could not previously have envisaged. I have been impressed with the bright ideas, quick thinking and collaboration that has enabled us to deliver and continue to drive the modernisation of defence. We mustn't lose this, we must continue to harness these qualities, placing innovation at the heart of defence. Our adversaries will continue to seek to use the rapid pace of technological change of the current climate against us, and therefore we must adapt and evolve to stay ahead.



**Clare Cameron, Director Defence Innovation**

The investment of £6.6-billion on military research and development announced in the Spending Review will allow defence to prepare for warfare of the future while promoting the UK as a centre for technology and science. The additional investment will ensure MOD is exploiting the most advanced technologies into the hands of the armed forces. The settlement will also enable an ambitious and strategic shift which – if we all embrace it – will transform defence into an agile, technologically advanced organisation, able to understand, develop and exploit technology and new ideas faster. We have a huge opportunity.

Making defence innovative by instinct is as much about being innovative in the culture, policy and processes as it is in the delivery of cutting-edge technology. We've been working

closely with DE&S' Future Capability Group (FCG) and the Acquisition and Approvals Transformation Programme (AATP) to help drive changes that make defence and its acquisition system more agile – through speed, tempo, adaptability and resilience. Both the AATP and several key defence innovation programmes, including the Enhanced Command and Control and Intelligence, Surveillance and Reconnaissance Spearheads, are recognised as part of the top-tier of defence's most transformative initiatives, and key to driving through these changes and ultimately modernising defence.

Every single one of us can contribute by challenging the status quo, thinking proactively about how much risk we can take, sharing lessons and working collaboratively to spark and exploit bright ideas.



**James Gavin, DE&S Future Capability Group Head**

It is worth remembering that DE&S exists in a competitive environment, working to deliver innovative capabilities which deliver operational advantages over those of potential adversaries. For me, innovation is about putting novel ideas, technology and ways of working into practice. The delivery of cutting-edge ships, aircraft, land and Space systems, are at the heart of what innovation is about for our teams.

In my own group, which has a mandate to 'explore' technology towards 'exploitable capability', we have had recent successes in many areas including 'expeditionary robotics'. You can see innovation reflected in both the platforms

and their usage, but also in the acquisition processes, such as BATS – Buy And Try At Scale. 'Agile by default' and 'speed to value' are quickly becoming bywords for our work. Iteratively developing and getting capability into the hands of the users is becoming our standard way of working. I think over the next year we will start scaling and developing this way of working into new technology areas, as well as ensuring that we embed agile practices into the continuous development of operational systems. We also need to do more to partner with others in defence and cross-sector innovation ecosystems.



**Professor Dame Angela McLean, MOD Chief Scientific Adviser**

The Latin word from which innovation derives actually means renewal: a connection that is especially relevant as we embrace a future outside the European Union and look forward to a post COVID-19 future. The MOD Science and Technology Strategy 2020, published in October, makes clear that innovation in defence has a vital contribution to make to renewed competitive advantage

for the UK, by bolstering our security and the effectiveness of our military capabilities, and by supporting our broader resilience and prosperity. DE&S plays a critical role in nurturing innovation – innovation from within DE&S, from industry partners, and of course from the research programme I fund – and turning the promise of that innovation, into real-world benefit.



## DE&S commercial model harnesses new technology

DE&S commercial manager, Brad Hayward, speaks to Desider about the Buy and Try at Scale (BATS) commercial process that DE&S Future Capability Group (FCG) has developed to enable rapid experimentation into capability of novel technologies.



The DE&S Future Capability Group (FCG) is developing and influencing potential future equipment and technology used by our armed forces by using a forward-thinking commercial process: Buy and Try at Scale (BATS).

The BATS process is an innovative way of driving small scale procurement quickly, for the customer to experiment with 'in the field' while further developing their understanding of emerging technologies, unpicking Defence Lines of Development (DLODs) – various elements that contribute to the delivery of defence capability – and ultimately informing and de-risking future requirements.

DE&S FCG commercial manager, Brad Hayward, said: "There are a multitude of opportunities to challenge standard conventions in order to enable experimentation and procurement in technologies. Supporting the development of future requirements for the armed forces, the FCG team needs to

drive efficiencies and innovation in what we do, and how we do it."

The BATS process operates through the establishment of an overarching framework for the project that ensures industry has completed and signed all relevant terms and conditions up front. This framework then goes into a competitive tender, with selected companies supplying small numbers of platforms and systems for experimentation with the relevant trials units.

Following these experiments, feedback helps to define further experiments. This process of innovate, experiment and feedback is repeated until a mature requirement is established for any potential future operational procurement.

Brad said: "This novel approach to procurement, albeit in an experimental context, has proven a popular solution with industry and has afforded FCG the ability to get the latest technologies into the hands of the customer.

"This speed of activity goes

some way towards bridging the gap between the pace of change in technologies and the requirements for the front-line commands' future transformational efforts."

The BATS process delivers across several FCG projects while the commercial team continues to develop and improve BATS to fit the requirements and expectations of industry and the armed forces. This experimental journey has delivered some tangible benefits to both the customer and the FCG team, with these dynamic ways of working driving results, learning and innovation in how DE&S can support the future developments of the armed forces.

Brad said: "To drive such innovation at speed, while trying to keep up with the ever-evolving threats and technological advancements, there is a necessity to increase the appetite for risk and operate in a manner that is more proactive, pragmatic and flexible."

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flexible  
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Brad Hayward, DE&S  
Future Capability Group  
commercial manager

## BRIMSTONE ONE MISSILE, MULTIPLE PLATFORMS

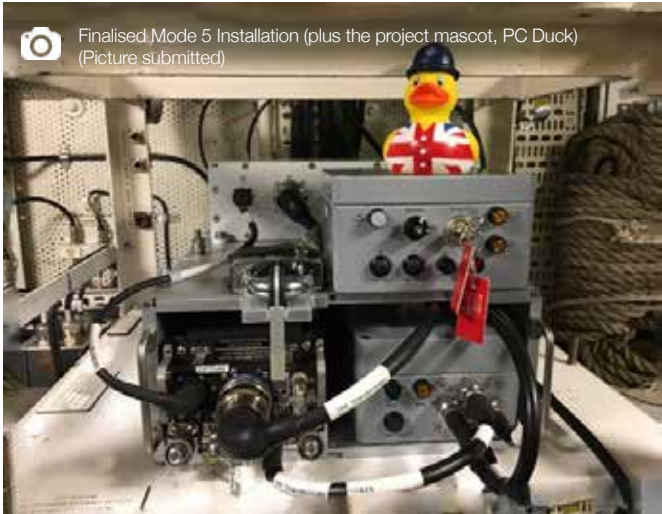


### BRIMSTONE, THE UNIQUE OPERATIONALLY PROVEN 'ONE MISSILE, MULTIPLE PLATFORM' WEAPON FOR FAST JET, RPAS, HELICOPTERS AND LAND VEHICLES.

In service with Typhoon and identified for the UK Apache AH64E, Protector RG Mk1 and land vehicles including UGVs, Brimstone will provide key new capabilities to the Royal Air Force and British Army for high intensity, peer on peer, countering mass armour warfighting. Brimstone is a lightweight strike missile with an advanced "true" dual-mode mmW/SAL (Semi-Active Laser) all-weather seeker offering a unique capability of engaging a wide range of target types, including high-end armour, fast moving vehicles / vessels in both land and naval environments and in both direct and indirect modes. Operationally proven with unequalled mission success rates across multiple theatres, Brimstone has proved to be the weapon of choice with its ability to perform surgical strikes in time and collateral critical missions.







## Protecting Royal Navy ships with Mode 5

An innovative system that can detect whether an aircraft, helicopter or vessel is ‘friend or foe’ has been installed on Royal Navy ships operating in the Middle East.

Mode 5 – the next-generation Identification Friend or Foe (IFF) system – recognises potential threats and targets by using advanced cryptographic techniques and world-leading electronic technology. This enables UK land, sea and air units to quickly identify friendly forces. In turn, this allows the UK to operate safely alongside NATO partners across any battlefield and significantly reduces the risk of friendly fire.

The previous system, Mode 4, was removed from service during 2020 and without Mode 5 the UK would be unable to meet its obligations to overseas coalition operations. Delivered by the DE&S Air Platform Systems (APS) delivery team, the System

is also being integrated on around 400 aircraft, helicopters and ships.

Last year, APS agreed a contract amendment with Leonardo and their sub-contractors to install Mode 5 capability onto Royal Navy ships deployed in the Middle East on Operation KIPION. Two small teams were deployed to oversee the installations on two mine countermeasures vessels, an RFA in Bahrain and a Type 23 frigate in Oman.

Daren Collis, APS team leader, said: “This was a major planning and logistics task that required excellent communications and the support of multiple stakeholders, which has resulted in a significant capability uplift to the Royal Navy.”

Acceptance trials were completed in December 2020 and the new equipment is now being used in theatre, with allies and other UK units providing an essential defensive capability.

## Defence Sourcing Portal goes live

An important milestone in the interaction between defence and its suppliers has been met with the launch of the new Defence Sourcing Portal (DSP).

The portal is now live and is a central access point compiling all MOD adverts, pre-qualification and tendering opportunities, and all relevant information on working in partnership with MOD. Using the portal will allow secure online document exchange and clarification management, removing inefficient email and paper-based business practices.

The DSP is a market-leading platform provided by Jaggaer and is widely used across government departments and industry. Replacing Defence Contracts Online, the DSP reflects a system that is already used internally and enables MOD personnel to manage the opportunity through its journey to becoming a contract in a more effective way.

Graham Hyndman, Director Commercial Improvements, said: “The DSP will significantly improve our procurement activities, streamline processes and modernise the way we do business. It’s important that suppliers register on the DSP so they can view and bid for new opportunities. Feedback has been positive with suppliers stating the portal is intuitive and easy to use.”



## MantisX – an empowerment project, not just marksmanship

After securing £150,000 from the Defence Innovation Fund, DE&S has trialled an innovative tool to aid small arms marksmanship, giving the British armed forces the edge on the battlefield while reducing training costs.

Delivered via Bluetooth, the MantisX sensor is fitted to the marksman’s chosen firearm where the system analyses and evaluates

each shot and generates data that is sent straight to the user’s mobile phone.

The innovative system accurately identifies where the shooter can improve, meaning the user can immediately better their performance and accuracy.

Chris Chennell, senior architect, DE&S Digital, said: “Through some absolutely fantastic collaboration between

front-line units, Army HQ, DE&S and our suppliers – enabled through tools like Defence Share – we have managed to add features, feed into future product development and capture the feedback to help bring this into service.

“It really is empowerment in action to see a Corporal make an improvement suggestion, other users to say ‘that’s a great idea’

and the equipment manufacturer chip in to say ‘that’s an easy thing for us to do and we want to make your lives better. We’ll build it and have a new version to you in a few days.’

“The Initial Look Request is now with Solder Training and Special Projects and I’m looking forward to feeding into their work on this.”

Aircraft restoration company technicians re-fit the tailplanes using profile boards (Picture submitted)



## Future of RAF BBMF Lancaster secured

One of only two Lancaster bombers still flying today will be given new tailplanes to keep the iconic WWII aircraft airworthy and ensure it can be enjoyed by future generations.

The Battle of Britain Memorial Flight (BBMF) team, part of DE&S Typhoon delivery team, has awarded a £1.4-million contract for routine scheduled depth maintenance as well as the manufacture and replacement of left and right tailplanes for the Lancaster PA474.

Wing Commander Andy March, deputy chief engineer for BBMF, said: “No Lancaster

tailplanes have been built since the 1940s and many of the original materials, tools and drawings are no longer available. This means that jigs and tools will have to be designed and manufactured before work can commence.”

The Tailplanes project represents a huge technical challenge, including work that has not been undertaken since manufacturing ceased. A set of tailplanes from a Lancaster at a Canadian museum have been borrowed to help with the project and will be used as patterns where there are no original Drawings –

at the end of the project they will be refurbished and returned to Canada.

There are only two airworthy Lancasters left in the world – 7,377 were built – and this work will enable the aircraft to continue as a key part of future BBMF display seasons for years to come.





## Shepherding initiative delivers leading-edge guidance on defence acquisition

The Weapons Operating Centre (WOC) at DE&S has introduced a 'shepherding' initiative aimed at helping deliver cutting-edge science and technology into defence acquisition.

'Shepherds' are appointed to provide the circa 100 industry and academic partners, including Falcon Project, QinetiQ and University of Liverpool, with advice and guidance on the acquisition process to help them understand what is and isn't possible or realistic as well as transferring knowledge back into the WOC.

It is hoped this support will help more advanced and innovative science and technology get taken from concept through to physical manifestation, and additionally encourages more staff across the WOC to embrace the use of cutting-edge science and technology in their projects.

Ultimately, it is hoped that this enhanced approach will result in even more effective, efficient and safe equipment being developed

for DE&S' customer – the armed forces.

Nat Reglar, the scientific adviser with the WOC, said: "Shepherds apply their knowledge and experience to the initiatives they are working on. In turn this benefits their professional career and development by getting to understand what cutting-edge science and technology looks like, expand their knowledge and how to incorporate this work into their projects.

"We match enthusiastic staff from the WOC with the scientists and engineers delivering science projects. Innovation is a two-way street and our industry partners appreciate the Shepherds because easy engagement is an important success factor for open innovation.

"We want to avoid a situation where there is lots of really impressive ground-breaking science being done in the lab that fails to ever see the light of day. That's not enough for defence. We need our scientific break-throughs to make a difference to the armed

forces and that means utilising WOC's most important asset – its staff."

James Davies, from the Short-Range Air Defence team, is currently in a shepherding role, and participates in quarterly review meetings, interrogates reports and makes sure that acquisition insight is included.

He said: "I've really enjoyed being involved in the shepherding role within the Weapon Sector Research Framework. I'm currently involved in Novel Fills and Super Lightweight Gun Concepts. My expectation is to understand how these new technologies can be implemented into future systems in the coming years, as well as expanding my personal professional development."

WOC colleague James Bower, of the Defence Ordnance Safety Group, who is studying for a PhD, agrees: "It's a good place to be between industry, Dstl and academia to properly understand the context and wider picture. I

felt a bit out of my depth at the start, but I've got to the point now where I can really contribute, and it gives my PhD studies real-world meaning"

Nat concluded "You can only exploit what you know about and shepherding is helping the WOC see the future."



CGI image of SPEAR3 next-generation mini cruise missile (MBDA)

## Artificial Intelligence – the next great era of computing

Chief Digital Information Officer, Nigel Shaw, talks to Desider about his team's current work on automation and a future with Artificial Intelligence (AI). "AI means computers behaving more and more like humans" says Nigel, "which can be either a frightening or exciting prospect. I personally think we need to be positive and look at how we can exploit these technologies in both the business and battlespace arenas."

Over the past two years the DE&S digital automation team has been building software robots to perform arduous and repetitive manual tasks, such as cross-checking data accuracy between financial and inventory systems, processing inventory for disposal and conducting line-by-line checks on aircraft parts against air worthiness standards. One of DE&S' first Robotics Process

Automation processes, nicknamed LAURA – Logistics Assistant Using Robotic Automation – has been delivering continual benefit, working in the inventory space to process over 30,000 lines of dispositions for almost two years.

Once built, these robots 'join' a team and free up existing team members to perform more valuable analytical and decision-making activities. Nigel

believes that by combining smart technology with human insights organisations can transform how they operate at a process level.

"We have a plan to automate over 250 processes over the next five years with 35 already implemented" says Nigel. "We are also starting to use a technology called "natural language processing (NLP) to analyse large amounts of written text, and we are deploying

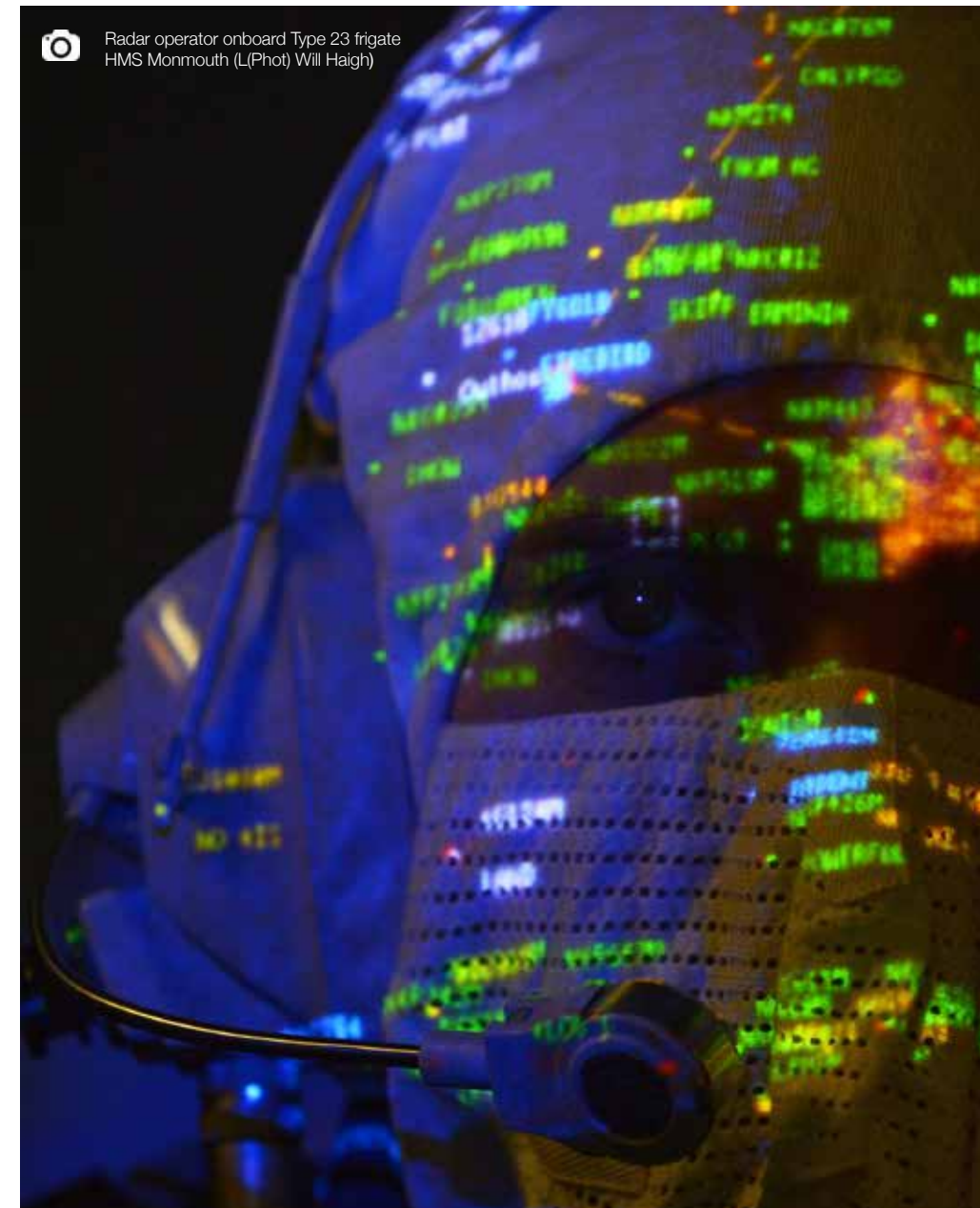
powerful new tools to analyse large data sets and identify patterns a human would struggle to find."

Nigel explains this is just the start of the AI journey. When applied to the huge amounts of data created by the digital era, increasingly smart computers will be able to conduct research, identify patterns, prompt decisions and take action.

In the battlespace sphere, an impressive example of this is the new autonomous Mine Hunting Capability (MHC) in the ships domain. AI software allows a single controller to set the high-level mission objective for multiple devices, all of which combine to re-optimize the plan during the mission, collecting real-time information on new threats and performance, communicating with other devices and re-tasking any devices which have completed their mission. Similar intelligence has been built into the anti-drone and ground-based air defence systems being delivered by the Strategic Enablers domain.

Adrian Baguley, DE&S deputy CEO, said: "We have made some excellent steps in DE&S to begin our AI journey.

We must, however, go further in both environments – this is a matter of business survival for modern businesses and in the battlespace our potential adversaries are investing heavily in AI – we simply cannot risk being left behind. To succeed, we must transition from this being a specialist endeavour to one where our whole workforce can help us identify the opportunities and mitigate any threats AI presents as we chart our course into the Information Age."



Radar operator onboard Type 23 frigate HMS Monmouth (LPhoto) Will Haigh)



# Combat Air Strategy Team shapes the future of air power



The DE&S Combat Air Strategy Team (CAST) is responsible for providing support to the delivery of the UK's Combat Air Strategy, including early programmatic and technical work for elements of a sophisticated Future Combat Air System (FCAS).

CAST provides crucial expertise to support MOD Head Office in establishing a complex acquisition programme with international partners – publicly known as Tempest – to deliver the capabilities required when Typhoon starts to leave service from the mid-2030s. This is expected to deliver new capabilities within an adaptable FCAS comprising of highly connected crewed and uncrewed aircraft that can be rapidly upgraded through life.

CAST is also playing an important role in supporting early work on innovative combat air solutions through the underpinning FCAS Technology Initiative (FCAS TI) delivered by the RAF Rapid Capabilities Office (RCO). FCAS TI represents a significant Government investment of around £2-billion over 10 years into an agile research and development portfolio to keep the UK at the cutting-edge of Combat Air Systems.

The most high-profile initiative under FCAS TI is Team Tempest: a co-funded demonstration programme between the MOD and industry to jointly work on key FCAS technologies. Innovations from Team Tempest include new radar technology developed by Leonardo that is capable of providing over 10,000 times more data than existing systems. The new sensor will enable the aircraft to capture huge amounts of data – equivalent to the internet traffic of a large city such as Edinburgh – from the battlespace every second. The aircraft will use new sensors to locate and target enemies well before they are targeted themselves.

Additionally, BAE Systems has begun flight testing 'wearable cockpit' technologies for Tempest. The concept sees the physical cockpit controls replaced with augmented and virtual reality displays projected inside the helmet visor. Another concept allows a 'virtual co-pilot' to take on some of the pilot's responsibilities, with an 'avatar' built into the cockpit to interact with the pilot.

Engineers from Rolls-Royce are also developing advanced combustion system technology as part of the company's power and propulsion work. A next

**The new sensor will enable the aircraft to capture huge amounts of data – equivalent to the internet traffic of a large city such as Edinburgh - from the battlespace every second.**

generation combustion system will need to operate at higher temperatures than any previous platform, increasing engine efficiency and meaning it can go further, faster and produce less carbon dioxide. Advanced composite materials are being explored, as these will produce lightweight components capable of operating at these higher temperatures.

Team Tempest reaches beyond defence to bring the very best in innovation from across the UK. DE&S provides programme delivery expertise, working with RAF, scientific experts from Dstl and industry partners in the collaborative Team Tempest construct, with CAST also acting as the commercial and airworthiness authority.

UK suppliers are transforming to be able to meet the challenges of building the next-generation combat air system and to be sustainable for the future. CAST is enabling and driving this transformation by supporting the implementation of new approaches to deliver complex acquisition and next-generation FCAS capabilities at significantly reduced cost and time.

A new approach to harnessing digital capability and managing software will be central to achieving such targets. To enable this, another exciting focus for CAST support to FCAS TI is PYRAMID, a revolutionary project which aims to reduce the cost and complexity of mission system software for current and future air systems.


Chris Melton, DE&S FCAS TI assistant head, said: "We see PYRAMID as the future for air, and potentially wider defence. Our joint vision is to make it the standard for the UK whilst gaining wide adoption elsewhere. This will radically transform achieving and maintaining capability advantage, at pace and affordably."

Recently, CAST delivered a major update to the PYRAMID Exploiter's Pack, which contains all the information required to develop compliant systems or software components. This is now being distributed to selected early adopters in industry and can be

considered for roll-out across current and future air systems.

Elsewhere, CAST is working with RAF, Dstl and industry to further develop the RAF's Lightweight Affordable Novel Combat Aircraft (LANCA) concept that looks to utilise uncrewed platforms to offer increased capability, protection, survivability and information when deployed alongside core combat aircraft. A £30-million contract was announced earlier this year for team Mosquito – another MOD/industry partnership – to design and manufacture a full-scale demonstrator, leading to a flight test programme that will provide evidence on the potential of the LANCA concept.



 Computer Generated image of the proposed Team Tempest Future Combat Air System concept (BAE Systems)





# On operational advantage, making a difference and keeping creative

**Buhe Ncube leads the DE&S Defence Growth Partnership programme, where challenging the norm is championed when considering the best solutions to complex projects.**

## **What does your role involve?**

I am the project lead for the Defence Growth Partnership programme (DGP) – a cross sector initiative that co-invests with industry to meet the complex challenges of modern warfare. The initiative supports businesses in proving pioneering technology and maturing it beyond commercialisation to attract further investment and exploit opportunities. Our work is in the pre-concept space working with a wide range of stakeholders, so our armed forces continue to maintain an advantage in the battlespace and to help them consider the evidence gathered to de-risk future capability. I am responsible for delivering innovations that span across defence priorities such as autonomy and immersive training through collaboration and engagement with industry.

I am also responsible for delivering another project that aims to demonstrate a fully integrated sensor analytics, data fusion and sensor management system and provide the Army with insight and lessons of its potential use, exploiting the military benefits of technology. Our flexible and collaborative approach in working allows for pushing the technical risk without feeling they would be commercially reprimanded.

## **What about your role is exciting, rewarding or interesting?**

The DE&S Future Capability Group continues to be forward thinking and challenge the norm. For nearly three years, I have been part of the experimentation team working with a diverse team of people who are extremely knowledgeable and resourceful. I was briefly deployed for about nine months, to support the

cross-cutting team to deliver a deployable additive manufacture workshop facility for the Navy in a short time frame. I am finding it rewarding to regularly see projects from initiation to completion and each day presents a different challenge, and an opportunity to learn something new. It can be incredibly fast paced and I often need to utilise an array of skills to tackle complex barriers to innovation.

## **How important to you is teamwork?**

Teamwork is essential as everyone is part of a team in either a family, sports or in work. There is an African proverb that says 'it takes a village to raise a child' and I believe that a win for one is a win for all. Teamwork ensures that every individual is vital and has a key role to play in contributing to the larger picture. The right combination of skills and abilities can motivate a team to deliver a project or drive organisational change.

## **How are you helping embed change in your area?**

Implementing the co-investment model encourages collaboration with industry and front-line commands. I engage with small businesses to transpose the innovation strategy into real successes and gain exposure to novel technologies in the market. I build relations across multiple stakeholders across defence and deliver an approach that meets all the wider strategic priorities.

## **Why did you choose to pursue a career in DE&S?**

My career in DE&S happened by accident. I had spent 10 years in the hotel sector and was looking to do something different. I had no knowledge of the

military environment apart from what I've seen in the movies and it was through a conversation with a relative who was employed in the MOD who referred me to a job opening, and the rest is history. DE&S is dedicated to supporting the work-life balance and provides ample opportunity to advance your skills. It is an organisation where I feel diversity and flexible working is truly supported.

## **What do you most enjoy about your job?**

The role enables me to consider the best solutions to complex projects and I feel like I am making a difference within the organisation. The variety of opportunities is never-ending, and it stretches me out of my comfort zone as I continue to focus on driving innovation and gather evidence to inform future capability development.

## **What do you enjoy doing in your spare time?**

My passion is art and I enjoy being creative. I like travelling to interesting places with great scenery, going for walks and taking photographs. I love spending quality time with my son who is confident, keeps things interesting and has a great sense of humour. I also go to church and volunteer where I connect with people from different walks of life who share their personal journeys of faith.

## **What might surprise people about you?**

I lived and worked in the wilderness of Uluru (Ayers Rock), one of the natural wonders of the world and the heart of Australia. I learnt a lot about the Aboriginal community and sampled some kangaroo meat.



## £180-million Army vehicle contract protects 700 Glasgow jobs

A £180-million contract awarded to Thales UK will protect hundreds of Scottish jobs over the next 10 years, supplying Remote Weapons Stations (RWS) to the British Army's new Boxer vehicles.

The 10-year RWS contract will protect 700 existing jobs at Thales UK and support 30 apprenticeships.

RWS notifies soldiers of enemy threats via a digital display from the safety of inside the Boxer vehicle – providing extra protection for troops deciding to evade or engage the target. The system also offers advanced situational awareness through 360 degrees long-range observation cameras to identify and defeat threats while moving at speed.

DE&S director land equipment, Major General Darren Crook, said: "This is another significant step forward for Boxer and I am delighted to see the different threads of the programme coming together. This is a military capability of the future to be proud of."

Following the sonar contract for Dreadnought submarines last year, this is Thales UK's second multi-million-pound contract within 12 months, further showcasing the Government's commitment to levelling up prosperity and opportunity across the UK.

Minister for Scotland, Iain

Stewart, said: "We look forward to working with Thales UK on the delivery of these Remote Weapons Stations, knowing this contract will not only contribute to the safety of British military personnel on the front line, but also support industry growth here in Scotland. "Protecting hundreds of jobs and supporting 30 apprenticeships, this £180-million UK Government investment further demonstrates our commitment to supporting the defence sector in Scotland and underscores the many opportunities available within the United Kingdom economy."

Minister of State for Defence, Baroness Goldie, said: "This £180-million contract with Thales UK will deliver pioneering surveillance and protection for our front line soldiers and our new Boxer fleet. We depend on skills and technology from across the United Kingdom and this order will secure 700 Scottish jobs. "Our troops face a myriad of new and emerging threats so it is imperative we invest in critical detect-and-destroy technology such as this."

The UK re-joined the Boxer programme in 2018 and has committed £2.8-billion to deliver more than 500 vehicles to the

British Army. The first vehicles are scheduled to be ready for service in 2023.

The contract was awarded to Thales by Rheinmetall BAE Systems Land (RBSL) and Rheinmetall Landsysteme.

Managing Director of Thales Vehicle Tactical Systems and

Optronics and Missile Electronics UK, Steven Lockley, said: "Thales' sub-contract is a great step forward after months of hard work. Working with our strategic partners, Thales is bringing new skills and technologies into the programme, our facilities in Scotland and the UK supply chain."

“  
Protecting hundreds of jobs and supporting 30 apprenticeships, this £180-million UK Government investment further demonstrates our commitment to supporting the defence sector in Scotland and underscores the many opportunities available within the United Kingdom economy.  
”

Minister for Scotland, Iain Stewart



Boxer vehicle participating in the Army Combat Power Demonstration on Salisbury Plain (Jack Eckersley)

## Going the extra mile to protect British Army troops



Image shows bergan drops from Malloy Aeronautics, heavy-lift aircraft during Exercise Olympus Warrior (PO Phot Si Ethell)



The DE&S Future Capability Group (FCG) has been tasked with investigating whether mission-critical supplies can be delivered autonomously to British Army troops on the front line.

Under Project THESEUS members of the FCG team want to establish if the use of autonomous systems can reduce the risk to life of ordering, planning and delivering vital items like food, water and spare parts into a hostile combat environment.

These often short but dangerous journeys are referred to as 'last mile' logistics but, in fact, this concept refers to any distance up to 30km.

After direction from the British Army, FCG has adopted a novel approach to garner evidence through buying, testing and supported development, allowing them to shape and deliver a key set of experiments and investigations.

The FCG team has also exploited the innovation, findings and technology demonstrator investigations delivered by the Defence Science and Technology Laboratory (Dstl) Autonomous Last Mile Re-Supply (ALMRS) project.

Evidence gathered will be used to inform future investment decisions by MOD.

James Morris, assistant head of the FCG pre-concepts, said: "Autonomy is becoming increasingly important in the battlespace. FCG is investigating not only the use of self-driving air and ground vehicles but also the autonomous processing, ordering and delivery of fuels, foodstuff and other stores to the troops over the 'last mile' of the battlefield – providing the troops with the ease of an Amazon-style delivery service where they need it most."

James says that in a relatively short time, the small team of experienced staff across multiple functions within FCG has created a potentially ground-breaking model that incorporates commercial frameworks, tasking research and development contracts, small-medium enterprise enabling contracts, Buy and Try at Scale (BATS) and large-scale systems experimentation.

All this is aimed at delivering the best possible evidence generation while maintaining value for money in an attempt to de-risk future acquisition.

FCG has engaged with a vast amount of industry specialists, drawing on groups set up to support logistics through the COVID-19 pandemic, as well as

much wider in the UK supplier base than ever before.

This creation of a community of interest contains more than 50 suppliers of all shapes and sizes, who have developed everything from full systems to novel component parts. Meanwhile, the FCG aims to build on what they do best, and not only prove the concept and shape future requirements generation, but to create an industry base that can work together to build best-in-class systems.

James added: "We are only at the beginning of the journey, and we have a lot of work to do to draw defence together and support multiple front-line commands, trials units, research organisations, Other Government Departments (OGDs) and even No10 strategies, but we take this opportunity now to articulate the THESEUS intent as widely as possible."

“  
FCG is investigating not only the use of self-driving air and ground vehicles but also the autonomous processing, ordering and delivery of fuels, foodstuff and other stores to the troops over the 'last mile' of the battlefield.  
”

James Morris, assistant head of the FCG pre-concepts





# DE&S celebrates the talent of its workforce during National Apprenticeship Week 2021

DE&S currently employs more than 400 apprentices who are learning and developing their skills for a long and successful career within the business.

DE&S recruits hundreds of new faces every year on schemes including engineering, finance and accounting, project management and business administration.

Sue Snowball, Entry Talent & Learning Support Lead, said: "We're always looking for talented and enthusiastic people across all backgrounds to start their exciting and fulfilling career with us. Here in DE&S, we make sure we help you develop your career throughout the organisation and we're always developing tomorrow's talent today by providing a great foundation and career progression."

Meet some of our apprentices, and former apprentices, contributing to DE&S.



**Callum Weaver,**  
**Project Professional Apprentice**

It's absolutely magic for Callum Weaver to be on a DE&S apprenticeship scheme.

The 23-year-old finished sixth form college after completing his exams to pursue his childhood dream of becoming a professional magician.

After five years working for a technology retailer, he joined the organisation as a Project Professional apprentice. Callum keeps up his passion for performing tricks in his spare time, as well as being the president of the Bristol Society of Magic.

Having worked in the Ships domain for his first year, he is now on another 12-month placement with the Submarine Delivery Agency. But are there any transferrable skills from magician to project professional apprentice at DE&S?

"It is so transferable because, doing magic, you get to know people and also work with people," said Callum.

"And also, the performing as well. You are standing up in front of people and showing them something, putting them into a performance and shining a spotlight on them.

"I always think that working within DE&S is all about putting a spotlight on other people and making sure that everyone's getting the most out of what you're doing.

"This is going to sound really boring, but what I've enjoyed most is just learning. Everyone's just been so nice and, in the teams that I've had the opportunity of working with, the people are just wonderful."

**Emily Wilson,**  
**Engineering Degree Apprentice**

Emily Wilson has the proud honour of being a two-time apprentice.

She had already completed a level three apprenticeship in civil engineering, worked for a year in that profession and achieved her Eng Tech status – a recognised level of professional registration – before joining DE&S.

She is now in the first of five years of her Engineering Degree apprenticeship, specialising in Aerospace.

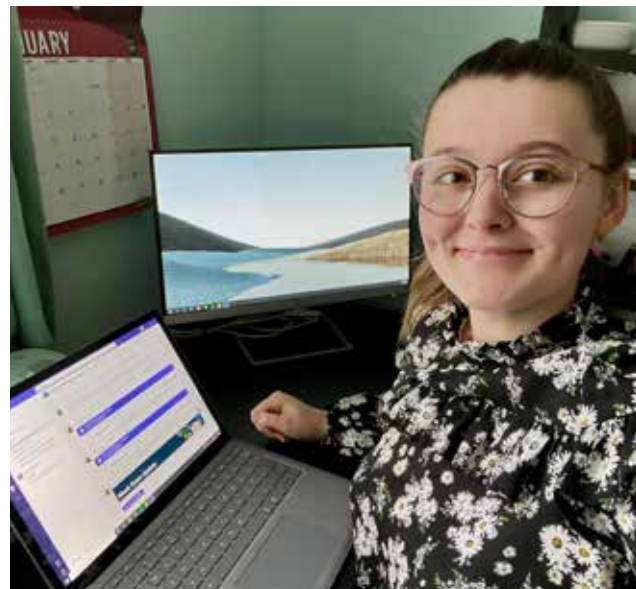
The 21-year-old said: "I'd applied for a lot of apprenticeships in the aerospace sector, but DE&S did have the best scheme available in terms of the company benefits and I think the main reason for me was this sense that it didn't seem as corporate as other employers.

"The studying is really interesting. Obviously, it's a step up from a BTEC to a degree so it has been hard, but I have been enjoying it."

Emily's ambition is to work on Hercules or A400M aircraft and she is even building a 1:72 scale model of an A400M in her spare time.

Emily added: "I think the main benefits of working with DE&S is the scale of opportunities you actually have.

"There's so many different things you could be doing and that the variety makes it really attractive."



**Emma Quigley, Scheme Manager, Engineering Degree Apprenticeship**

If anyone epitomises the benefit of an apprenticeship at DE&S, it's Emma Quigley.

The 27-year-old joined the business after doing her A-levels and started her advanced engineering apprenticeship a decade ago, completing it in 2014.

Emma was also MOD Apprentice of the Year, an award presented by a member of the royal family.

Fast forward to the present day and she is the scheme manager for the weapons, nuclear and aerospace engineering degree apprentices studying at Weston College.

Emma, who is also a swift water rescue technician with Longtown Mountain Rescue Team in Wales, said: "I found the DE&S scheme and it kind of combined my enjoyment of maths and physics and engineering, but also supporting the armed forces.

"In my current role, the thing I enjoy most is supporting apprentices and helping them with their first steps in their career.

"I had a couple of really good apprentice managers during my time on the scheme - Chris Warn and Kate Perry - and that really helped me with my personal development.

"Having completed an apprenticeship myself, I fully understand the challenges and how difficult it is to gain work experience and study alongside that.

"Having that experience, I've brought that forward and feel that I can use that to support current apprentices and develop the existing schemes to make them better and more appropriate."

**Samuel Maggs, Business Administration Apprentice**



The trust DE&S put in their apprentices has been massively rewarding for Sam Maggs.

The 23-year-old, who is on a placement in the Ships domain secretariat, said: "It's actually been a real pleasure seeing how the theory that we're learning for the NVQ has actually applied to real-life situations.

"My proudest moment is almost certainly the commendation I received from the head of the Corporate Services Group.

"At the beginning of last summer, with everybody suddenly being told to work from home, the organisation decided to set up an on-site COVID-19 operations cell and a business support hub.

"People were asked to volunteer to come onto site to provide support for essential workers who couldn't do their work from home.

"Having only been there a couple of months, but to still be trusted to give that support in the difficult scenario that we were in, and then to have that recognised with a commendation and an award afterwards, was really special.

"The apprenticeship scheme provides a good alternative to those that don't want to do a degree, who want to go straight into the working world, that may not feel like they've got the qualifications or the experience to do so.

"But, on the other end of the spectrum, we've got people in the cohort who are already established in a job and wanted a career change."



**Iona Williams,**  
**former Engineering Advanced Apprentice**

A passion for engineering and hands-on learning was what led Iona Williams to a DE&S apprenticeship.

And, having completed her three-year advanced engineering scheme, she is now a corrosion engineer in Naval Ships Support.

"I chose to be an apprentice at DE&S because I was at college doing an engineering course and I kind of wanted to continue that," said the 23-year-old.

"I didn't want to go to university, so I applied for a DE&S apprenticeship and saw they had lots of different domains and quite a variety of stuff for me to get involved with.

"Since leaving the apprenticeship and regrading, I have become a level one engineer and one of the job roles I have taken on is managing the Warpaint publication document, which is used as the main acceptance document for paints that are approved for Royal Navy vessels."

Iona is reminded of her proudest moment as a DE&S apprentice every time she looks up at the metallic object on the shelf above her home work station.

She explained: "When I was in college, I had free time after completing my assessment piece, so I actually made a cannon. I engraved my name on the side. It moves as well, so I'd definitely say this has to be my proudest moment."





# Innovation across DE&S

Innovation is high on the agenda at DE&S. Desider takes a look at some of DE&S' most inventive projects.

## Defence Growth Partnership

The Defence Growth Partnership Innovation Challenge continues to build a strong innovation ecosystem through strategic collaboration with industry partners and academia. The partnership provides innovative and competitive solutions for the armed forces and the final phase of the co-investment challenge – one of numerous Defence Innovation Funded initiatives – aims to prove novel solutions to defence challenges.

The Future Capability Group continues to accelerate their focus on collaboration with industry through flexible commercial approaches with partners investing £6-million to generate ideas, concepts and skillset to inform the MOD of future acquisition requirements.

Clare Cameron, Director Defence Innovation, said: "These projects are proving a unique and exciting opportunity for MOD and industry to partner together and rise to the challenge of exploring novel ways of staying ahead of our adversaries. The joint approach not only fosters collaboration but also boosts defence exports and sales into adjacent markets, increasing the number of high-quality jobs in the UK. From cutting-edge realistic air combat training to developing a super-intelligent navigation system, the partner companies have demonstrated commitment and creativity in pursuing dynamic solutions to the complex challenges of modern warfare."

## Project Minerva

Future Capabilities Group (FCG) is delivering an autonomous man overboard recovery system – named MINERVA – that can be used to rescue personnel who fall overboard from the Royal Navy's largest ships. Minerva benefits from automatic take-off and landing, automatic search, location and monitoring of personnel, and carriage and automatic deployment of a life raft. Both the detection and automation systems are being developed by Planck Aeronautics and integration onto the GFX Unmanned Air System is being developed by Malloy. This system could be deployed across several vessels and warships and has the potential for both military and civilian applications.

Recently, successful phase 1 trials were carried out at the Defence Diving School, in which a Deadfred Dummy was placed in the lake and the system autonomously launched. It followed inputted waypoints and located the dummy in the water, and remained there as a station keeping system. Phase 2 trials, in which the system will be tested further prior to phase 3 vessel tests, are imminent.

## Expandable Active Decoys

The Air Commodities delivery team have been supporting the delivery of full-sized inflatable target ground assault systems – such as tanks – that are used to provide realistic visual, radar and thermal image signatures of targets for use during training exercises.

Targets are permanently located at RAF Spadeadam – the only Electronic Warfare Tactics facility in Europe – and allow tri-services aircrew and NATO forces to perform air-to-ground combat manoeuvres and tactics against a variety of threats and targets they may experience in contemporary warfare. The training simulations allow fighter controllers to experience a realistic environment to prepare them for situations where it's necessary to call in accurate air support for soldiers on the ground.



## Digital Twins

DE&S Digital is exploring ways of using the Digital Twins concept to address business requirements. The concept of a Digital Twin effectively means a dynamic digital representation of any part, system or organisation, which enables people to understand how it operates, enables capabilities, responds to change and delivers value.

Digital Twins assume a model-driven approach to better visualise and analyse the impact of change as well as guaranteeing the accessibility to all intelligence gathered. It can provide a medium in defence to collaborate on the development of a capability and then support it as it evolves through its entire lifecycle.

The concept is most advanced on the Tempest programme, where it is being used to design, test and support every single system and structure for Tempest. It is also the basis for BAE Systems' Factory of the Future at Warton in Lancashire, which uses data from intelligent robots, supply chain databases and machines to streamline the manufacturing of Tempest.

Pylons, manufactured by Leonardo, are positioned underneath the wing and fuselage of the aircraft. The pylons themselves come with digital sensors that can be used to measure the structural health and fatigue associated with the part.

The aim is to provide a single point of aggregation of all data needed to make informed living judgements on the pylons, clearly visualising relevant data and enabling different modes of analysis. The purpose is to demonstrate that the Digital Twin can analyse in-service operational data from BAE-managed systems to support any recommendation.

## Explosive Ordnance Disposal (EOD) capability

In partnership with Dstl, DE&S has developed world-class hardware named REMIX that jams radio-frequency signals to prevent radio controlled improvised explosive devices (RCIED) from being detonated.

Remix can be used alongside other existing jamming capabilities to protect specialist EOD users in challenging operating conditions. Since achieving full operating capability in October 2019, a total of 34 systems and additional spares have been delivered to the Army and are now in service.

British Army electronic counter measures advisor for the 521 explosive ordnance disposal squadron, Staff Sergeant (Yeoman of Signals (Electronic Warfare)) Michael McCallum, said: "Since its introduction, REMIX has seamlessly integrated with our existing capabilities. It is reliable and intuitive and this gives our soldiers confidence in the operation of the equipment. It has been a welcome addition as we look to counter the traditional and emerging radio controlled improvised explosive devices (RCIED) threat."

## Robust Global Navigation System (R-GNS)

DE&S is working with QinetiQ to design and manufacture R-GNS – a next-generation global navigation satellite system receiver. R-GNS will provide defence applications with satellite receiver options that are far more resilient to interference than those found in a phone, watch or car.

The centralised investment in the powerful silicon-chips will make technical solutions available for application projects across defence and even for critical national infrastructure.

QinetiQ plan to manufacture a range of receivers with various capabilities for different applications. The first being the Macro Module: designed specifically for applications where space, weight and power are constrained.

DE&S, Dstl and QinetiQ worked together to design the production of the Macro Module that was approved on time and the team is now preparing to take the design to a foundry to have the silicon chip manufactured.



Image shows R-GNS chip (pic submitted)

Innovation funded

## Nano Unmanned Aerial System

Cutting-edge remote-controlled nano Unmanned Aerial Systems (nUAS) are continuing to be trialled by dismounted close-combat soldiers, in the UK and overseas. Having supplied 90 systems from four industry partners to the Army in 2020, DE&S is preparing to supply another 75 systems to several battalions this summer.

The latest nUAS will offer a great deal more capability than seen previously in the nUAS weight class, expanding on the reconnaissance and surveillance build of previously employed systems to also encompass night surveillance, weaponised, obscuration/distraction payloads and communications rebroadcasting. The systems will be deployed on exercises in UK and Cyprus training areas by this summer.

The project is one of several Transformation Funded projects under the FCG Experimentation banner that has been demonstrating the effectiveness of the Buy-And-Try-At-Scale procurement model, which puts technologically advanced equipment in the hands of troops far quicker than would traditionally expected.





# Graham Russell – reflections on his time with DE&S and RAF

**After 40 years in the Royal Air Force Graham Russell looks back at his varied and successful career as he leaves the role of Director Helicopters with pride.**

Of all the things Air Vice-Marshal Graham Russell will miss as his time at DE&S comes to an end, the people he has worked with, managed and called both friends and colleagues are top of the list.

The Director Helicopters has retired after more than four years in the key role, 40 years after joining the Royal Air Force.

“We’ve achieved massive amounts at DE&S,” he said as he reflected on a varied and successful career both inside and outside the business.

“We’ve achieved huge savings and efficiencies for the department, significant increases in the cost effectiveness and effectiveness of support, and successfully driven some of our procurement programmes against some really demanding timelines and cost profiles.

“But I would say it’s always the people that you remember. I have been immensely proud to have been Director Helicopters.

“The people within the Helicopters Operating Centre have continuously delivered outstanding results for the front line and for DE&S across the whole of the in-service support arena, as well as in a wide range of acquisition projects.

“The positive feedback I received from our customers is testament to their hard work and excellent results. I couldn’t have asked for a more dedicated and professional team who have consistently gone beyond what they were contracted to deliver to ensure DE&S met its commitments. So, I can say nothing more than ‘Thank You’ and I wish all of you success in your future careers.

“Helicopters is one of the few places within DE&S where you get civil servants, contractors and people from all three Armed services mixed together in a blended way, supporting the aircraft.

“Every single day there’s something where you can say: ‘I’m really proud of that’. You can see the positive impact on people and the positive impact on what we deliver to the front line.”

Graham joined the RAF in 1980 and was sponsored by the force through university, graduating from Salford with a degree in aeronautical and mechanical engineering. That is where his professional foundations were laid, and his ethos of continuous improvement.

He added: “Every day is a school day, as they say, and if you don’t go away from work thinking crikey,

I learned a lot today, you’re probably not getting the best out of your potential.”

Graham has worked with fast jets, large aircraft and helicopters in support and logistics roles across the RAF and Ministry of Defence. His first job at DE&S started in 1997 on the Eurofighter project, where he became the lead author of the innovative Typhoon Support Solution.

A fellow Wing Commander in the team at the time was none other than DE&S CEO, Sir Simon Bollom.

From 2003 to 2006, Graham was a team leader on the defence logistics transformation programme. He was C130 Hercules and TriStar delivery team leader (2010-12) and, after a senior engineering role in Air Command, returned to DE&S as Dir Hels in 2016.

During his time as OC Engineering for RAF 2 Group, he spent two and a half years in Berlin and was there when the wall came down in 1989.

“I’ve always said every job is what you make it and every job has been special in its own way,” he said.

“However, the real memories have been forged by people coming together to do amazing things in times of crisis or need, and delivered operational capability in timescales that would not normally be possible.

“The occasions that stand out are the significant ISTAR capability upgrades we delivered onto Nimrod at the start of the first Gulf War, the enhanced night-flying capabilities which equipped Chinook just before the Afghanistan deployment, and the additional airdrop capabilities delivered to the C130 Hercules to support disaster relief.”

After catching up on some DIY, in retirement Graham plans to get involved in community and welfare projects and is considering part-time mentoring.

“Clearly it’s going to be a big change, but I am really proud of everything the teams I have worked with have achieved over the years,” he said. “I like to think I have ‘made a difference’, both in terms of delivering capability and helping people grow, both as a professional and as a person.”



## DE&S Mine Hunters take future tech to sea

Image shows world-class automated minehunting systems off of the coast of Tregantle (Charlie Perham)



DE&S has recently delivered advanced mine countermeasure systems to ensure the Royal Navy remain a world leader in the vitally important field of mine hunting – a transformative project that is critical to the UK's security and prosperity.

As announced by Minister for Defence Procurement, Jeremy Quin, two Mine Hunting Capability (MHC) programmes have entered their production phases that will transform the way in which the Navy operates.

The joint UK and French Maritime Mine Countermeasures (MMCM) programme will deliver leading-edge autonomous mine hunting equipment including portable operation centres, autonomous surface vessels, towed sonars and mine neutralisation systems. Additionally, the Royal Navy's first fully-autonomous minesweeping capability – SWEEP – tows a variety of equipment configurations to generate magnetic, acoustic and electronic signatures behind autonomous boats. Used to

defeat modern digital sea mines, the minesweeping capability can detect and target ships and submarines and is controlled by a Portable Command Centre which could be based either at sea or on land.

The new systems use novel ways of working, combining uncrewed and autonomous boats, submersibles, robots and a range of potential delivery platforms – including aircraft – to allow personnel to operate at a remote distance from the minefield.

DE&S MHC team leader, Barry Miller said: "The technology DE&S deliver is essential in dealing with an extremely challenging threat that could prevent free movement through vital trade and access routes around the world. Like their land equivalent – the roadside bomb – sea mines can disable advanced assets worth billions of pounds and create a huge impact on the economy.

"Around 95 per cent of goods arrive in the UK by sea and our way of life is dependent on that continuing uninhibited.

We also ensure that our nuclear deterrent submarines can operate unhindered, which is the ultimate guarantee of our national security."

The DE&S MHC team continue to deliver across a broad portfolio both in the UK and overseas. A current focus for the team is project WILTON. Operating at HM Naval Base Clyde, the team is working closely with a trained Navy team who are developing an autonomous route survey capability. In addition, further innovative projects including solar-powered drones and future-proof testing equipment are being developed as part of this transformational capability.

Explaining how the team is designed to encourage collaboration, agility and innovation, Barry said: "There is a range of experience within the team, from graduates and apprentices all the way through to Navy operators. This creates a team where a wide range of skills are available, enabling innovation.

"One of the challenges for all of us across defence is having the

courage to step into the unknown. We are learning to have a greater appetite for risk in this respect – especially the senior leadership who are 100% behind us."

"DE&S must stay on the front foot in delivering the innovative thinking and novel technology which can defeat current and future mine threats."



## 60 second spotlight

INNOVATION  
at DE&S

### Chris Chennell

#### Job:

Automation Architect, DE&S Digital

#### Your route into DE&S?

I started in DE&S just over five years ago. I was in the private sector previously but had a taste of defence through my reserve service with 6 Rifles – I enjoyed it but was a bit late in starting my armed forces career to do that full time, so I came to DE&S to use my civilian skills in defence as well as work for an employer who would be supportive of my reservist commitments.

#### Your claim to fame?

Young Rifleman award at the 2014 6 Rifles shooting competition at the age of 33. The General awarding that had a hard time reconciling the name of the award with the person standing in front of him! (It goes to the best shot with less than five years' service)

#### Your advice to anyone?

Always imagine conversations from other people's views – personal, or business, it's vital to consider people's state of mind and what they want to pick out common ground to build relationships on.

#### What do you do when you're away from work?

Exploring is my biggest thing. Whether it's on a mountain bike or on foot, I love exploring the ruggedness of Welsh mountains or the Lake District. With COVID-19 limiting travel, I've been indulging in another of my hobbies, classic cars – I'm currently restoring a 1980 Lancia Beta Coupe.

#### What are you most proud of?

It's hard to pick one, but I'm proud of how I use my background to best effect. The combination of IT solution architect and infantry reservist is very rare and has put me in a great position to deliver the MantisX marksmanship training

tool and is a success I hope to repeat with similar projects in the future.

#### If you were sent to a desert island, what three things would you take with you?

Hmm. A culture novel by Iain M Banks, a machete and an OS map. The book and map to help me imagine new adventures, and the machete as the tool to help me put together an island resort paradise before rescue arrives.

#### What irritates you the most?

People with a closed mind to new ideas and ways of doing things, they are missing so much.

#### What is your favourite place in the world?

It has to be the Lake District – we have so much fabulous geography in the UK. Just being there makes me proud to be British, daft as that sounds.

#### What would surprise people about you?

Probably not a lot – I'm brutally honest so not much gets hidden.



Always imagine conversations from other people's views – personal, or business, it's vital to consider people's state of mind and what they want to pick out common ground to build relationships on.

Do you or someone you know deserve their 60 seconds in the spotlight?

Email  
Louisa.Keefe101@mod.gov.uk



Dambusters 100 challenge

This May, Chris Della Porta and Andy Markham from the DE&S business learning team are raising money for the RAF Benevolent Fund by taking on 'The Dambusters Ride' to celebrate the 100th birthday of the last Dambuster: Squadron Leader George 'Johnny' Johnson DFM.

This May marks the 78th anniversary of the Dambusters raid and Royal Air Force Association (RAFA) and RAF Benevolent Fund are organising events to celebrate the centenary of George Johnson who lives in Bristol.

DE&S teams of seven - the same number as a Lancaster crew - are being challenged to raise £100 by running, walking, cycling, rowing or even climbing 100 miles by May 15 2021.

Chris will complete the Dambusters Ride around Lincolnshire sites and Andy will complete the 80km RAFA "Lancaster Ride" by the same

date. Additionally, the F-35 Lightning 617 Squadron will fly from her deck, having also taken on the challenge.

Andy said: "I was unwell last year with severe depression and lost my fitness. This is part

of my recuperation and the Dams Ride reflects what DE&S does well: military and civilian teamwork, innovation and rapid delivery."

<https://rafbf.enthuse.com/pf/chris-della-porta>



jHub coding scheme benefits DE&S COVID-19 ops cell

The jHub Coding Scheme aims to give MOD staff the opportunity to gain valuable coding and cyber skills as well as improve the way in which UK defence operates.

DE&S COVID-19 Operations Team lead, David Fielding, recently began the coding scheme by taking a course in web development. He has since implemented the skills he learned and created the DE&S COVID-19 contact tracing process for the DE&S COVID-19 operations cell.

Initially, the team worked from a basic flow chart process to track suspected and confirmed COVID-19 cases across DE&S establishments. However, the COVID-19 operations cell needed a more structured, consistent and user-friendly way of reporting and storing data in relation to COVID-19 cases.

David said: "I needed to present the complex system in a simple way and using my recently learned web development knowledge I created a "concertina" webpage that allowed Ops Team users to quickly drill down to the detail they need and notify relevant stakeholders."

He explained that because of this system, DE&S has been able to proactively report suspected cases to Public Health England, who shared that they were confident that DE&S internal controls and processes were robust. The system that David developed has now processed over 1,000 pieces of data.

"It was extremely reassuring to hear that PHE are content with our methodology. Without completing the jHub course I wouldn't have been able to create this system," said David.

MOTTO the MOD Lottery October winners

£10,000	Michael Stanley, Middle Wallop
£2,500	Mark Swan, London
£1,000	John Hynd, Aldershot
£500	Peter Brockies, Bristol
£250	Neil Weaver, Portsmouth
£100	Caroline Rogers, Corsham
	Jayne Fitzsimmons, Taunton
	Aston Proudley, Fareham
	Lindsay Freeman, Upavon
	Catherine Toque, DSTL
	Kevin Houghton, Southampton
	Helen Chester, Loughborough
	Dorothy Bjorck, Northwood
	Em Beardsley, Larkhill
	Valerie Rose, Bristol
	Ian Wright, Carlisle
	Rod Carter, Portsmouth
	Helen Lloyd, Portsmouth
	Adrian Taylor, Corsham
	Jo McCarthy, Southend-on-Sea
	Suzannah Teacy, Aldershot
	Smudge Smith, Thetford
	Debbie Duffet, Andover
	Bernadette Batters, DSTL
	Gordon Davidson

Proactive obsolescence programme gains defence innovation award



Paula Hadfield wins CSSC Merit Award

Paula Hadfield, from the Support Directorate support chain modelling team, has recently been awarded the Civil Service Sports Council (CSSC) Merit Award – the highest award that can be bestowed upon a CSSC volunteer.

The honour is only for those who have given highly meritorious voluntary service and Paula is only the second female in the South West to ever receive this award since its inception in 1978.

Paula has been a volunteer for Yeovil Area association for the last 21 years where she represents members at committee meetings, mentors new event organisers, assists

with volunteer training and helps devise policy. Previously winning 'Volunteer of the Year' three times, Paula was completely shocked to receive this award.

Paula said: "What a total surprise it was when I received my letter from the CSSC Chair, Mark Fisher. I'm immensely proud to receive this very special award. 2020 wasn't a great year for any of us, but when I learned I was a recipient of the highly coveted Merit Award, my mood immediately lifted, and I felt so honoured to have been nominated."



DE&S was recently recognised in Team Defence Information's (TD-Info) prestigious Excellence Awards in partnership with Allan Webb Ltd (AWL).

TD-Info is an association that informs defence information policy and pilots new ways of working. TD-Info celebrates cutting edge ideas and collaborative good practice amongst supplier, customer and defence users showing innovative solutions that demonstrate 'improvements - or potential improvements - to the Defence user'.

DE&S worked with AWL to enable the collection of data across MOD and the supply chain, utilising collaborative working with the ships obsolescence lead, using research and development as well as innovative adaptation of

data exploitation techniques, to develop an understanding of obsolescence risk for each platform.

Dr Matt Darkin, DE&S ships obsolescence lead & DE&S fellow for obsolescence, said: "It was very rewarding gaining TDI Excellence Award "runner up" as this is a defence wide recognition of synergetic innovation in data exploitation and support obsolescence methodology to support and maintain Royal Navy resilience in operations."





# Case Study

Matthew Coates, Corporate Service Group Business Administration Apprentice, gives his insight into some of the benefits of working for the organisation

**Name:**

Matthew Coates

**Job title:**

Corporate Service Group business administration apprentice attached to Defence Standardization Team.

**How long have you worked for DE&S?**

Since February 2020.

**Why did you choose to pursue a career in DE&S?**

I wanted to give back to Britain and contribute to defence. Public service has always appealed to me and I enjoy working around the subjects and issues that we deal with in DE&S.

**What does your role entail?**

Defence Standardization team focuses on development: looking at standardisation management policy, business analysis, performance management and information management. I provide business support by organising meetings, taking notes and minutes at those meetings, organising and distributing documents and communications. I also frequently assist in core business matters. I've put together corporate team building events, built personnel rosters and distribution tools and ratified NATO standardisation agreements. The work I do is extremely varied and endlessly fascinating.

**What are the opportunities to develop and progress within your function?**

There are so many opportunities for progression and development within our function. You have the opportunity to learn so many new skills. There are

also mentoring programmes that you can apply for. You also have the opportunity to shadow individuals from other professions and other functions to learn more about other sides of the business.

**What do you most enjoy about your job?**

Contributing to the security and prosperity of the United Kingdom is extremely rewarding. The subjects and issues that we work on are very interesting. The people I work with are first-class professionals and eager to pass on their knowledge.

**What's your ambition?**

I would like to rise through the ranks of the Civil Service and make a meaningful contribution to the security and prosperity of the UK while being able to support a family and pursue my interests.

**What's your greatest achievement to date?**

I've assisted in putting on a virtual corporate event demonstrating the importance of innovation in DE&S with numerous speakers including author and innovation consultant, Elvin Turner, in the middle of lockdown for 300 members of staff at DE&S and led a project to do a similar event.

**Why would you recommend DE&S to others as a great place to work?**

You contribute to the nation and the world through your work, build a varied and highly relevant skillset and you work with first-class professionals you can learn a great deal from and enjoy working with.

**What are the social benefits of working for DE&S?**

As a civil servant, you are eligible for membership of the Civil Service Sports Council, giving you access to on-site sports facilities and equipment for a very low monthly price. The main facility in MOD Abbey Wood also has an on-site nursery. After six months, you can join a flexible working scheme, giving you elastic office hours. Finally, the pension scheme is excellent, one of the best in the UK.



## SIX GREAT REASONS TO WORK FOR DE&S



Bonuses & Recognition



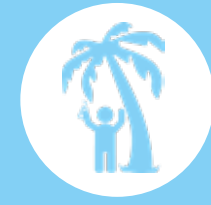
Pension



Flexible Working



Professional Development



Holiday



Facilities

For more info and job opportunities visit:  
[www.des.mod.uk](http://www.des.mod.uk)





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