



midlands aerospace alliance

MIDLANDS

AEROSPACE

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MAGAZINE



CELEBRATING 100 YEARS OF THE RAF

A look at Lincoln's pivotal role
in the WW1 war effort.

See page 8.

READY FOR SOME DRAMA?

Don't miss out on the next event at the MTC on 23 October. See page 5.

FLYING HIGH AT FARNBOROUGH

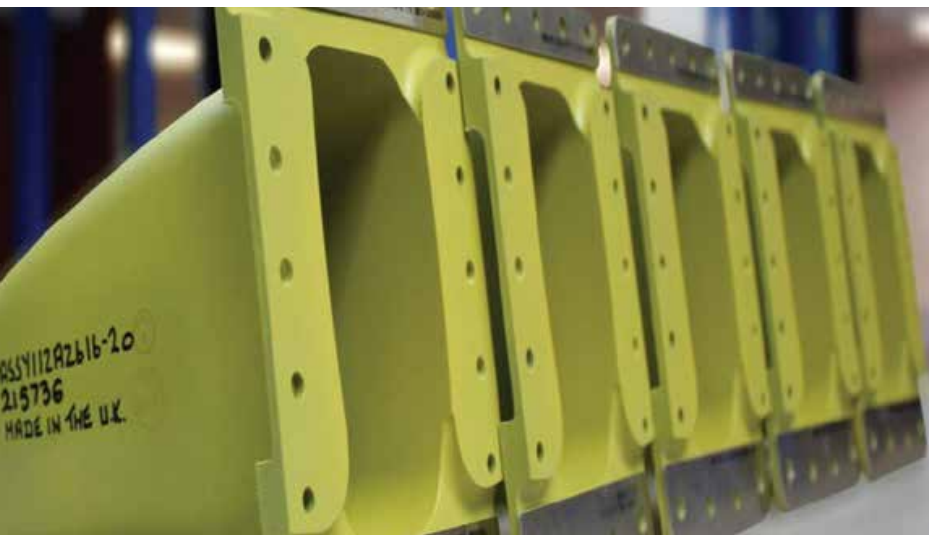
FIA2018 was a good year for our member exhibitors. See page 7.

LINCOLN AND THE RAF

A spiritual perspective.
See page 14.

Update

BOEING ANNOUNCES TWO MIDLANDS SUPPLIERS TO NEW SHEFFIELD FACTORY



Boeing has announced the selection of UK-based companies to supply all the raw materials to its new Sheffield factory, which will make components for the 737 and 777 passenger jets. Boeing's first European factory will produce 7,000 actuation system components each month, which will be shipped for assembly in Boeing's Portland, Oregon plant in the United States.

Two Midlands companies are among the five, made up of Aeromet, Mettis, Maher, MetLase and NIKKEN.

Worcester-based Aeromet will supply Boeing Sheffield with high-strength, complex and multi-core aluminium cast parts. Mettis Aerospace in Redditch will supply Boeing Sheffield with steel alloy precision-forged components.

Slat cans house actuation systems for moveable surfaces on aircraft wings. Historically these parts were fabricated or welded together – Aeromet casts these parts for several major aircraft OEMs.

MAA 2ND ANNUAL DINNER

As we go to press, the Midlands' premier black tie dinner is about to take place at the Council in Birmingham on **October 11**, with Chairman of the Midlands

Members of the Midlands aerospace and defence industry will gather at the Council House in Birmingham for an evening of business networking.



For more information about the forthcoming event call Anne Esterson on 02476 430250 or visit the MAA website.

G&P HEADS TO THE IHUB

MAA member G&P has become one the latest aerospace businesses to open an office at the state-of-the-art iHub at the Infinity Park in Derby.

The company, whose global headquarters are at Fort Dunlop, has opened the site to bring its staff

closer to its existing and prospective aerospace clients.

G&P's award-winning Quality Excellence Model has been fundamental to its growth, and in 2017, helped its customers reduce waste by more than £1.4billion.

"Our move to the iHub is a major step forward in helping more aerospace businesses tackle waste levels and address any quality issues faced in production and the supply chain which are due to the increasing demand for aircraft deliveries," said David Whiffin, G&P's Director of Aerospace.



NEWS ON THE WEB [Click through to the MAA website for current news on members' activities:](#)

→ **Preci-Spark** posted revenue of £33.9million for the year to 31 December 2017, up from £28.8million in 2016.

→ A new training centre is being opened by the **Nasmyth Group** in Nottinghamshire to provide apprentices with an up-to-date classroom and workshop area.

→ **Burcas** has secured a new funding package to support its aim of growing turnover by 20 per cent through domestic and international sales

→ **TLM Target Laser Cutting** expands its laser technology portfolio with the addition of the comprehensive Universal Systems Laser (ULS) range.

→ **Gardner Aerospace** has reported a period of 'sound progress', with sales reaching £203.4million, an increase of 15.7%.

TAKE TWO: THE SECOND AEROSPACE FORUM BIRMINGHAM IS COMING...

➤ Last year, Birmingham's International Convention Centre (ICC) played host to the first ever Aerospace Forum. And the outcome was truly remarkable, with top-line figures including:
➔ 400 delegates ➔ 250 companies ➔ 12 countries ➔ 3,900 B2B meetings ...over just three days!



With one of the world's largest clusters of aero engine and aircraft systems-makers and 300+ supply chain companies on its doorstep, the Midlands proved the perfect location; so much so, that we're hosting the second Aerospace Forum Birmingham.

Taking place from **March 19 to 21 2019** at the ICC in Birmingham, the forum has been organised by the MAA and French experts BCI Aerospace, with support from our big four: Meggitt, Moog, Rolls-Royce and UTC Aerospace Systems.

Day one of the event will be dedicated to the MAA's Annual Conference, while days two and three will involve scheduled one-to-one B2B meetings between customers and suppliers.

A few words from the forum's supporters:

"The Midlands is an important base for Meggitt plc, hosting key sites for our Aircraft Braking Systems, Control Systems and Polymers & Composites divisions. I'm pleased to offer our support to the Aerospace Forum Birmingham as an important opportunity to bring OEMs, Tier 1s and the aerospace supply chain together for mutual benefit." - **Tony Wood, Chief Executive, Meggitt plc**

"After the success of the first Aero Engine Forum, Moog are delighted to have the opportunity to return to support this valuable event, which helps us meet with existing and potential new suppliers for our aerospace programmes." - **Stuart McLachlan, Aerospace Control Components Sector VP, Moog Aircraft Group**

"Rolls-Royce is committed to boosting supply chain capability in aerospace and developing new and existing relationships, so we're delighted to support the Aerospace Forum 2019. It's a great opportunity to meet potential new suppliers and network with like-minded colleagues in the aerospace industry." - **Gordon Tytler, Director of Procurement, Rolls-Royce**

"The Midlands' aerospace supply chain has an important role to play in making aircraft manufacturing projections a reality. But we all need to work together even more closely if our companies are to benefit from this growth. The second edition of the Aerospace Forum Birmingham is an opportunity for us to meet together, discuss new business and improve our future performance." - **Robert Hupfer, Actuation Systems General Manager Wolverhampton, UTC Aerospace Systems**

For more information or to book your place visit the MAA website or call the MAA on 024 7643 0250.

READY FOR SOME DRAMA?

➔ Additive Manufacturing (AM) is playing an increasingly important role in the aerospace sector, with widespread adoption set to significantly transform the industry's supply chains.

Not only does AM have the potential to revolutionise the way aerospace components are manufactured and help the sector produce lightweight parts, it seems likely to reinvent supply chains. The outcome will be the prize of reduced emissions and fuel consumption.

It's also anticipated that the AM process will maximise the buy-to-fly ratio, with significantly less waste being produced compared to traditional subtractive methods.

Introducing – DRAMA

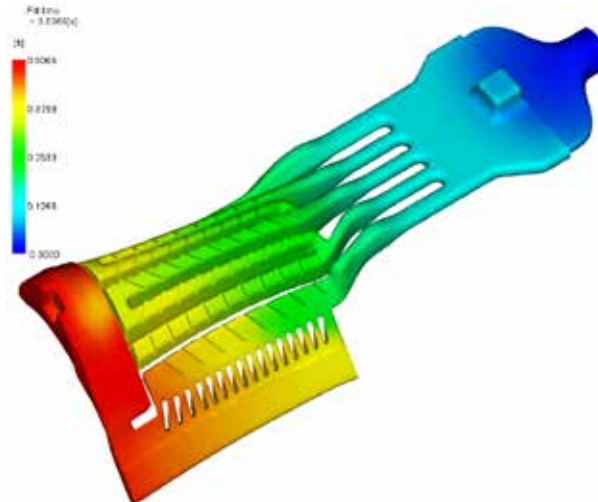
The Digital Reconfigurable Additive Manufacturing for Aerospace (DRAMA) programme, of which the MAA is a partner, is a three-year, £14.3million collaborative research project.

Work on the programme, which has been sponsored by both the UK Aerospace Technology Institute and the Industrial Strategy Challenge Fund, started in November last year and is being delivered by a consortium led by the Manufacturing Technology Centre.

It is envisaged that DRAMA will help to build a stronger AM supply chain for UK aerospace. World-class additive manufacturing 'test bed' facilities and a corresponding digital-twin virtual environment are being developed at the National Centre for Additive Manufacturing, located at the Manufacturing Technology Centre in Coventry, and Renishaw's AM Solution Centre in Staffordshire.

Key programme aims include:

- ➔ Cutting costs and set-up risks.
- ➔ Reducing the time and cost of planning and validation.
- ➔ Developing capability across the entire UK aerospace supply chain.



Gardner Blade's NATEP project researched how additive manufacturing could improve the control of cooling in die blocks

Programme partners – at a glance

- ➔ ATS
- ➔ Autodesk
- ➔ Granta
- ➔ Midlands Aerospace Alliance
- ➔ National Physical Laboratory
- ➔ Renishaw
- ➔ The Manufacturing Technology Centre (lead)
- ➔ University of Birmingham



Want a piece...

Are you interested in finding out more about how the DRAMA project could benefit your business and support your AM journey?

Come along to the next UK Aerospace Additive Manufacturing in the Supply Chain event, which is being organised as part of the DRAMA programme.

- ➔ Date: October 23, 2018.
- ➔ Time: 8.30am to 4.00pm.
- ➔ Venue: The Manufacturing Technology Centre, Coventry, CV7 9RD.

Visit the MAA website to see the agenda and book a place.

PROFILE

VIEW FROM THE MAA BOARDROOM



“Overall, there’s a shortage of good quality engineers, but that means that those who are good have nothing to fear.”

Peter Smith, CEO and Chairman of the Nasmyth Group and Vice Chairman of the MAA, says the future looks bright for Midlands engineers and that the UK’s work beyond Europe will help minimise the risks posed by Brexit.

Q. WHAT WAS YOUR FIRST JOB IN THE WORLD OF ENGINEERING?

A. I trained as a physicist and then adapted to engineering through the opto-electronics design area within the field of thermal engineering. That’s where heat-based, rather than visual pictures, are produced, which makes it very good for inspecting power lines or looking for overheating bearings in engines and many other applications.

Q. HAS YOUR ENGINEERING CAREER PATH PANNED OUT AS YOU EXPECTED?

A. Yes and no. Yes – because it’s taken me along the sort of paths and discussions you’d typically associate with aerospace, engineering, electronics, and so on. And no – because it’s also taken me on to the field of general management and indeed, ultimately, international business and ownership of a group. Engineering has provided me with the foundation for a much wider career.

“It’s important to recognise that in aerospace, the marketplace is the world and all of the individual parts to it involve individual demands.”

Q. WHAT’S THE ONE THING ABOUT YOUR JOB THAT MAKES YOU SMILE VERY DAY?

A. I never cease to be amazed and smile at the incredible strength of people working as a team and how much more can be achieved collectively, rather than individually.

Q. WHAT ARE THE BIGGEST CHANGES TO HAVE IMPACTED ENGINEERING IN RECENT YEARS?

A. There’s one over-riding change, digitalisation, that’s made an impact in all sorts of areas, such as the design process and operational procedures.

Q. WHAT’S THE ONE PIECE OF ADVICE YOU’D TELL YOUR TEN-YEAR-OLD SELF?

A. It’s amazing how lucky you can be if you work hard, be honest and care about people. There’s an amazing relationship between working hard and being lucky.

Q. WHAT DOES THE FUTURE HOLD FOR MIDLANDS ENGINEERS?

A. The future looks good. There are ups and downs, as there are in all sectors. Overall, there’s a shortage of good quality engineers, but that means that those who are good have nothing to fear. Automotive or aerospace may be up and down, but overall, there’s a good demand for good quality people.

Q. HOW IS THE NASMYTH GROUP PREPARING ITSELF FOR INDUSTRY CHANGE?

A. When it comes to globalisation, it’s important to recognise that, in aerospace, the marketplace is the world and all of the individual parts to it involve individual demands. It’s important to address these globally in order to be successful.

As for Brexit, I’m worried a little, but the UK doesn’t just work with Europe, we work with other countries and continents, such as the US and Asia, and this will help reduce the risks.

Q. WHAT DOES BEING VICE CHAIRMAN OF THE MAA MEAN TO YOU AND WHY?

A. I like the concept of sharing our experience and being able to give something back to the industry, as well as setting an example to some of the youngsters.

Q. WHAT’S THE ONE QUOTE/MANTRA YOU ALWAYS TRY TO LIVE BY?

A. Be consistent and live life with wisdom, compassion and courage.



www.nasmythgroup.com

FLYING HIGH AT FIA2018

↙ Farnborough International Airshow may have taken place back in July, but we're still blown away with just how fantastic this year's event was!

The orders and business generated at Farnborough are often a barometer for the state of the global aerospace industry, and FIA2018 was no exception.

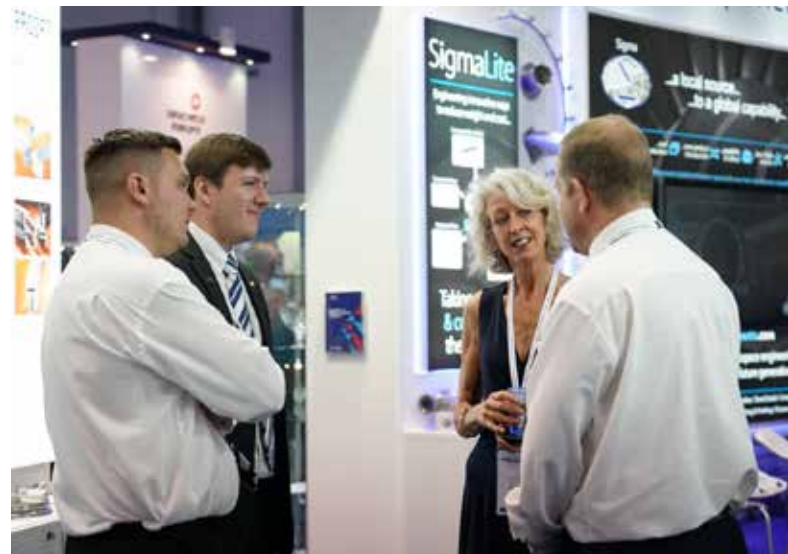
Once again, the MAA's stand featured within the UK Pavilion in Hall 1.

Spanning more than 270m² and with 28 pods and 24 exhibitors, the stand most certainly made an impression on passers-by and attracted plenty of visitors!


MAA chief executive, Dr Andrew Mair, said: "As the largest event in the aerospace calendar, Farnborough is undoubtedly the global shop window for the UK and international aerospace sector. We're delighted to have played a part in this key industry event once again.

"Our stand provided companies with an excellent base where they could meet with new and existing clients. It also provided them with an all-important physical presence to represent their company and talk to key contacts within the aerospace arena."

FIA2018 may have been and gone, but plans for 2019's Paris Airshow are already under way. See the MAA website for details.



WHEN LINCOLN WAS THE AEROPLANE CAPITAL

 *In this year when the RAF turns 100, we look back to when the city turned its hand to making aircraft for the Great War.*

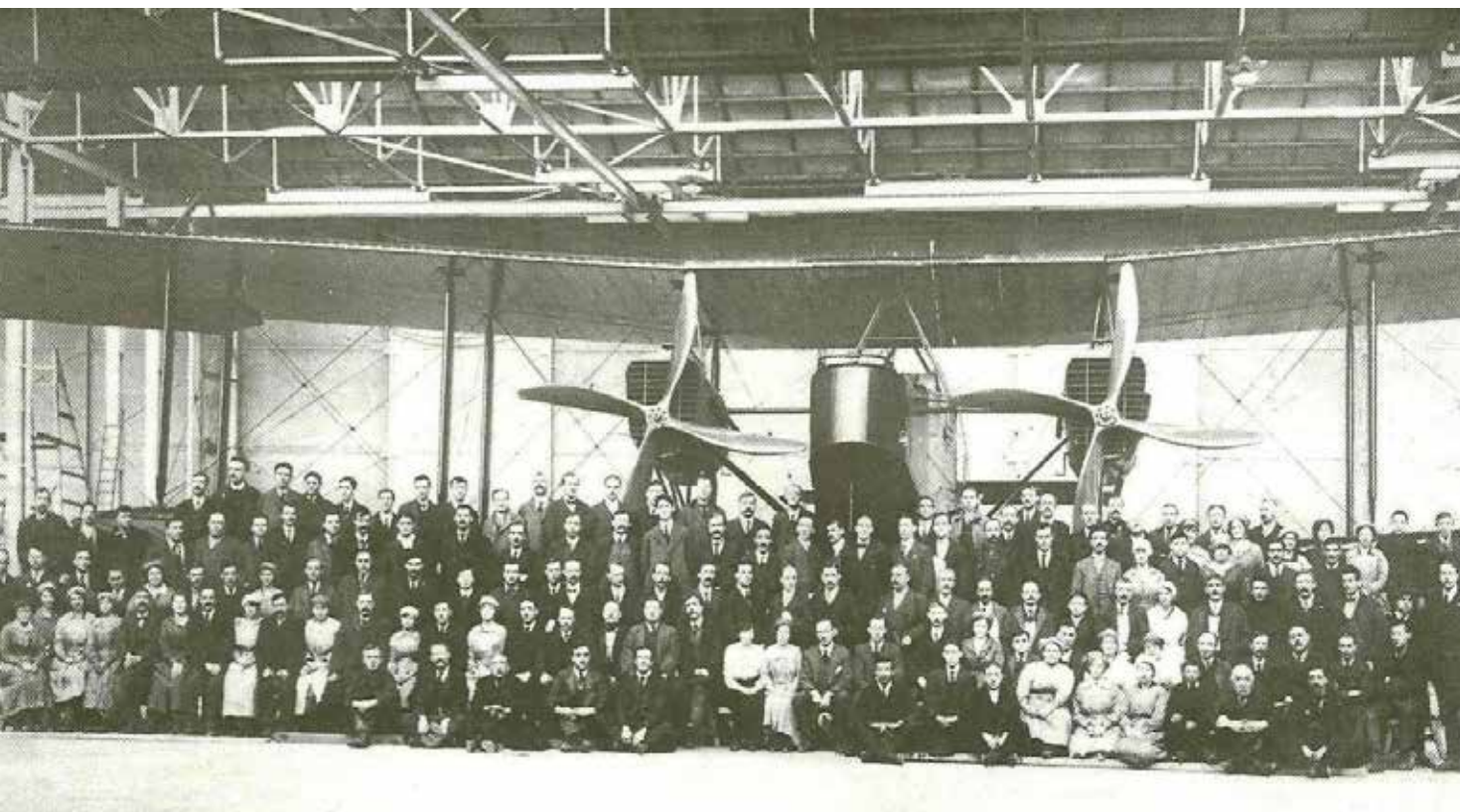
The story of Lincolnshire as “Bomber County” in the Second World War is well known and is being told to a new generation with the opening of the International Bomber Command Centre and Memorial with its own spire facing the towers of Lincoln Cathedral.

Lincoln’s association with the Great War tends to all about the design and development of the first tanks by William Foster and Company, a small manufacturer of tractor engines and threshing machines. Less well remembered is how other local agricultural engineering companies converted their factories and men -- and now the city’s women -- to making Lincoln briefly the country’s capital of aircraft production.

By the end of the war, Lincoln’s manufacturing machine had built an astonishing 3,700 aircraft and 4,000 engines for the new RAF and RNAS, eclipsing big Midlands industrial cities like Birmingham and Coventry to produce one in fourteen of all British aircraft - averaging 20 aeroplanes per week.

Ruston Proctor & Co. Ltd received its first order in 1915 for one hundred BE2c aircraft. By the end of the war the company had made 2,750 aircraft and 4,000 aircraft engines, employing some 3,000 men and women on the work. The engines made at Ruston’s included what was recognised as Britain’s most powerful and reliable aircraft engine of the period, the BR2 designed by WO Bentley (of racing and luxury car fame) at the Humber Motor Co in Coventry.

Ruston’s 1,000th Sopwith Camel was painted in the image of an Egyptian God of the Air and used on promotional tours to encourage people to purchase war bonds.



Clayton and Shuttleworth made Handley Page 0/400 bombers *(Photograph source: Society for Lincolnshire History and Archaeology.)*

Robey & Co. designed their own aircraft, the Robey Peters Gunbus, albeit with limited success. They built a test airfield south of the city. By the end of the war Robey's had made 270 aircraft, including some seaplanes.

Clayton & Shuttleworth built 720 aircraft, starting with the Sopwith Triplane. They also made the Handley Page O/400 biplane bomber, though most of their production was of Sopwith Camels. The Shuttleworth family would later set up the Shuttleworth Collection of vintage cars and aeroplanes in Bedfordshire.

While tanks were being tested on the slopes of Lincoln's South Common, on the West Common the No 4 Aircraft Acceptance Park was laid out. Here aircraft sub-assemblies were put

together for test flights. The aircraft were packed off for service and the manufacturers were paid. The archives report the deaths of a number of test pilots.

What of Lincolnshire's airfields, also more usually associated with WWII? In fact, the county hosted 21 airfields during WWI, some for defence against Zeppelin airship bombing raids from over the North Sea. (Zeppelins flew at high altitudes, up to 21,000ft, difficult for the early fighter aircrafts to reach.) Other airfields were built for training. While most were returned to farmland, RAF Waddington, of course, remains a major base.

No surprise, then, to see Lincoln remembering its part in the last 100 years with such gusto!



Aircraft were transported by road in kits. (Photograph source: Philip Jarrett.)



Ruston's celebrates the production of its 1,000th aircraft, specially painted. (Photograph source: Society for Lincolnshire History and Archaeology)



(The) Harry Hawker (second from left) visits Lincoln – Hawker was largely responsible for the Sopwith Camel. (Photograph source: Robey Collection.)

MAKING YOUR IDEAS HAPPEN

➔ In our last edition (Summer 2018), we highlighted (and quite rightly so) ten years of the MAA helping bring new technologies to life.

And what a fantastic ten years it's been, packed full of amazing ideas coming to life at virtually every tier of the aerospace industry.

The Midlands has been fortunate not only to have witnessed the arrival of countless technology improvements, and the MAA has been instrumental in helping some of these new ideas happen. Over the last decade, the MAA has helped more than 50 companies access £8million in funding and given our expert help to bring new technologies and processes to market.

What is being, and continues to be achieved, is truly remarkable. And it's why we're dedicating this article to highlighting some of the key new technologies that are making our highly-innovative industry tick better, and faster, right now.

New technologies delivered – overview

All sorts of ideas have been turned into reality across every single corner of the aerospace supply chain, including:

- ➔ Conductive adhesives using graphene
- ➔ 3D weaving of composite structures



- ➔ Small UAV engine development
- ➔ Innovative ceramic brake materials
- ➔ Inventory optimisation software
- ➔ Surface cooler technology
- ➔ Lightweight engine pipe fittings
- ➔ Additive manufacturing of bleed valves
- ➔ Nano coatings for long-life coatings
- ➔ High strength casting alloys
- ➔ Biocomposites development for aircraft interiors
- ➔ Engine control software timing

New technologies delivered – in detail

This list is just a small flavour of some of the innovations that are gradually transforming our industry. So, let's delve a little deeper and take a closer look at three new technologies in more detail, each product or process supported by the MAA as part of the NATEP programme...

Interested in reading about some more innovative aerospace technologies?

Then check out the MAA's New Technology Catalogue, which features more than 40 new technology-related success stories, including the three we've highlighted on these two pages. For a copy of the inspirational booklet, contact the MAA on 024 7643 0250 or download it from our website.

Here's to the next ten years of new technology innovation!





NEW TECHNOLOGY SPOTLIGHT 1: Visual inventory optimisation system

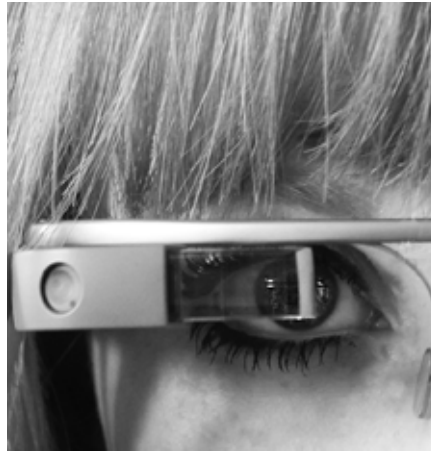
Key facts

- **Software spec and test:** Consult Avila (lead partner)
- **Software coding:** CANDA Systems
- **Customer:** RLC Engineering Group

Maintaining stock levels of aerospace components and materials at the optimum levels can be a problem, especially when this involves high part counts, many expensive parts, multiple sites, legacy parts, different customer programmes and contractual commitments, with varying call-off rates and replenishment lead times.

MAA member Consult Avila, and its partner, CANDA Systems, tackled this problem by developing a new visual management software tool (VIOS) to optimise inventory, with guidance from end-user RLC Engineering Group. VIOS provides users with data visualisation screens allowing dynamic inventory planning and control, incorporating best practices in inventory management such as trend analysis, alerting, forecasting, financial planning, and automated replenishment.

A NATEP grant enabled a prototype version of the VIOS software to be demonstrated to prospective customers and, assisted by valuable feedback from users, a full commercial version of the software has now been produced with production partner ValueChain Technology.



NEW TECHNOLOGY SPOTLIGHT 2: Hands-free inspection interface

Key facts

- **System development:** Muretex (lead partner)
- **Human factors:** Coventry University
- **Customers:** Cranfield Aerospace and major aerospace tier 1 customer

In this project led by Muretex, the partners investigated the use of an optical head-mounted display system to provide 'hands-free' aerospace inspection and assembly instructions without reference to printed materials.

A NATEP grant enabled the partners to develop the infrastructure and processes necessary to serve up work instructions in a readily assimilated manner, reducing operator workload and improving efficiency, accuracy and traceability. Trials at Coventry University were commissioned to demonstrate the benefits of using a head-mounted display system over the use of traditional paper and electronic work instructions.

Based on the experience gained with the NATEP demonstrations, Muretex has launched its Augmentor® service which offers bespoke solutions aimed at augmenting human capabilities through the use of technology.



NEW TECHNOLOGY SPOTLIGHT 3: Dry drilling of aluminium alloys

Key facts

- **Coatings development:** Teer Coatings, MIBA Coating Group (lead partner)
- **Tool design:** Kyocera Unimerco Tooling
- **Customer:** Airbus UK

MAA members Teer Coatings and Kyocera Unimerco Tooling have worked together with the University of Manchester to explore tools for in-situ, liquid lubricant-free drilling on aluminium alloy aircraft structures.

Tooling supplier Kyocera Unimerco had observed that dry, in-situ drilling of aluminium alloys, with no significant loss of drill tool performance, would simplify and reduce the cost of aircraft wing manufacture while also improving the workplace environment.

For aircraft manufacturers like Airbus, using cooling/lubricating fluids during drilling adds to the complexity of manufacture, and the management of traditional lubricants in an open factory environment imposes additional complexity and cost. The idea of dry-drilling was shared with the MAA at the Farnborough Airshow, and Peter Knight, NATEP Technology Manager at the MAA, acted as technology broker, introducing Kyocera to supplier of advanced coatings, Teer Coatings, part of the Miba Coating Group. Airbus quickly came on board as end user, and a NATEP project was born. Combining drill re-design and the application of advanced hard, solid lubricant coatings, the project team were able to demonstrate that dry drilling is not only feasible, but a practical reality which fulfils the performance and commercial requirements.

MEET OUR SUPPLY CHAIN PERFORMANCE GROUP

With increasing pressures for the UK aerospace industry to remain competitive on a global stage, it's important that we continually look at ways of improving supply chain performance. And because that is a key priority for the MAA, we have a dedicated Supply Chain Performance Group to guide what we do.

Made up of 14 members, the group's mission is to support member companies to improve productivity, quality and delivery performance within their supply chains.

The Midlands Aerospace Alliance is dedicated to growing the aerospace supply chain in the Midlands by helping us collaborate. And that's the most obvious way companies can benefit from being members of the MAA, by learning from each other and then working better together.

'In aerospace, you can be a customer, supplier and partner simultaneously. We're used to working with each other as competitors; we need to learn to work with each other to find the common objective in the most efficient manner. That's where cluster organisations, like the MAA, come in.'

'Everything we do has to be about making things better through change - whether it's growing productivity, higher quality, on-time delivery or lower costs. Experience has taught me that if you want a different outcome, you have to do things differently. You need a 'can do' attitude and then it's just a matter of finding out how.'

Annette Rothwell, Chair of the MAA Supply Chain Performance Group

GROUP MEMBERS



ANNETTE ROTHWELL
Chair of the Supply Chain Performance Group & Senior Vice President Operations Excellence at Esterline Technologies Corporation.



DR. ANDREW MAIR
Chief Executive of the Midlands Aerospace Alliance, the cluster organisation for one of the key UK aerospace regions.



JASON ALDRIDGE
Managing Director of Arrowsmith Engineering and Chairman of the Coventry and Warwickshire Aerospace Forum.



IAN BOUQUET-TAYLOR
Operations Director for TPT Consultancy and Training, responsible for sales, marketing and planning delivery of support consultancy and training.



STEVE BOYD
Managing Director at G&O Springs with over 20 years' experience in aerospace and passionate about performance.



PETER BRUCH
Managing Director & Co-Owner of AE Aerospace, SME elected Director of the MAA. Responsible for strategic direction and implementation.

How the MAA Supply Chain Performance Group helps members

The group delivers its work through guiding the following four work streams:

1. Additive manufacturing

The MAA is a formal partner of the Digital Reconfigurable Additive Manufacturing for Aerospace (DRAMA) programme and the group supports the MAA's involvement within this initiative. (Turn to page 5 for more details about DRAMA).

2. Midlands 'supply chain 21 competitiveness and growth' cluster

The group is setting up a first cluster of approximately 12 small manufacturers, who will work together to improve their performance under the UK national SC21 Competitiveness and Growth programme. They'll follow the model being implemented by the North West Aerospace Alliance.

3. Developing new manufacturing technologies

The group works with the MAA's Technology Development Group to promote participation by small manufacturers in funding schemes such as NATEP. The aim is to encourage more companies, that are traditionally considered as being 'make-to-print' firms, to build on their know-how and take part in research and development projects to solve their manufacturing challenges.

4. Industry 4.0/digitisation

The group promotes information dissemination, events and research projects related to digital manufacturing and supply chain management.



ADAM COOPER

Group Quality & Operations Excellence Director at Pattonair, with 20+ years' experience in aerospace quality, engineering and supply chain operations.



RACHEL EADE MBE

RED Ltd, transport supply chain specialist, 20 years' experience helping manufacturing SMEs access opportunities in auto, aero and rail supply chains.



TIM HOLMES

Head of Quality at Swiftool Precision Engineering, over 20 years' aerospace manufacturing experience, specialising in organisational development.



KEVAN KANE

Managing Director at Technoset Ltd. Head of Operations at the Rugby Division with 20+ years' experience within the aerospace industry.



TAMÁS MOGORÓSSY CPIM

Supplier Development Manager at Airbus UK Ltd, 12 years of experience in aerospace supply chain and quality.



DAVID SINGLETON

Supplier Development Manager at Thales UK. Experienced supply chain development professional supporting the UK aerospace and defence sector.



TIM TATTON

General Manager of Amphenol Invotec Ltd. Producing high technology, high reliability printed circuit boards for aerospace sectors.



MARK WHALLEY


Rolls-Royce Control Systems, Head of Supplier Development. Supply chain leader using his engineering background to help improve supplier performance.

THE VIEW FROM THE CATHEDRAL



Lincolnshire and the RAF: close bond for a century

In August, an RAF100 Dinner took place in Lincoln Cathedral's nave, with Air Vice Marshall Canon Paul Robinson's after-dinner speech perfectly capturing the county's contribution.

 *I don't need to explain the significance of the RAF to a Lincolnshire audience, and why the service is woven into county life. By virtue of geography, geology, topography, there have been so many RAF bases here, it was said that if a pilot closed eyes and landed blind, he'd land on an airfield.*

*The service has always had close links with Lincoln Cathedral. From 1,000ft, you can see the Cathedral from almost every corner of our county. Bomber crews said it was the last place they saw heading east, and on their return, the lucky ones used it as a beacon to find home. And it was not just a geographical beacon. As described in the book *Battle Order 204*, David Mattingley, a 22-year-old Australian, was a Lancaster pilot on 425 Squadron at RAF Kelstern, near Grimsby. Badly wounded over Germany and recuperating at Rauceby, Boxing Day 1944 found him and his brother, Brian, visiting a foggy Lincoln. They walked up Steep Hill, and I quote: "Then suddenly, as they reached the top, they emerged from the fog to see the Cathedral, in all its ancient splendour, bathed in sunshine. David caught his breath. It seemed an epiphany; an allegory of*

the triumph of light over darkness. Entering through the Great West Door, they paused to take in the sweep of the lofty arches with the light streaming through the windows above; and his soul sang with the glory of the great church, hallowed by worship for almost a thousand years. As they sat quietly in the Nave, the sound of the mighty organ rolled forth; reverberating through them like a score of Merlin engines. Then, from the exquisitely-carved Angel Choir, voices soared in the powerful anthems of Handel's Messiah. David felt washed, bathed, soaked, steeped in its healing affirmation. He truly knew that his Redeemer lived and, whatever might happen, held him in His almighty love." This beacon of spiritual faith still holds good for today's young RAF men and women.

Again, the Cathedral has its Airmen's Chapel, with its stained-glass windows, its laid-up standards with their battle honours, and – most moving – three Bomber Command Rolls of Honour, containing the names of 25,611 young aircrew, who were killed flying bombers from Lincolnshire airfields during WW2, nearly half of the Command's total losses of 55,573. Not for nothing

is Lincolnshire known as Bomber County. The sacrifice of those aircrew was truly heroic: all volunteers, 55% lost their lives during their first tour of 30 operations; a casualty rate higher than that for infantry subalterns on the trenches of WW1. Only 27% of bomber aircrew survived the War physically unscathed. It was their willing sacrifice that inspired Lincolnshire's Past Lord-Lieutenant, Tony Worth, to found the International Bomber Command Centre.

An Army colleague once told me that the RAF isn't old enough to have traditions, only habits. I would disagree. Throughout the last 100 years of continuous operations, the RAF's air and ground crews have led the way in meritocracy and diversity; proved adept at utilising cutting-edge technology; time-and-again displayed tactical innovation and imagination; and served our country with loyalty, dedication, tenacity and courage. And I'm sure even my Army friend would admit my service has now earned its spurs.



www.lincolncathedral.com

FOR YOUR DIARY

ONLINE: WWW.MIDLANDSAEROSPACE.ORG.UK/EVENTS

CALENDAR

The MAA organises more than 20 events a year

ADVANCED ENGINEERING
31 October – 1 November 2018
NEC Birmingham

Visit the Midlands Aerospace Alliance team at Aero Engineering hosted as part of the Advanced Engineering UK group of events.

AEROSPACE FORUM
19 – 21 March 2019
ICC, Birmingham

The forum has been organised by BCI Aerospace and the MAA, with support from our big four: Meggitt, Moog, Rolls-Royce and UTC Aerospace Systems.

DRAMA
23 October 2018
Manufacturing Technology Centre

Come along to the next *UK Aerospace Additive Manufacturing in the Supply Chain* event, which is being organised as part of the DRAMA programme.

MAA MEMBERS MEETING AND AGM
Nov, date and venue tbc

More details coming soon on the MAA website

PARIS AIR SHOW 2019
17 - 23 June 2019

Time to start planning ahead for the 53rd Edition of the Paris Air Show.



For further information and to book your place at an MAA event, please visit www.midlandsaerospace.org.uk/events

ABOUT THE MAA...

The Midlands Aerospace Alliance (MAA) is the voice of companies in the British Midlands supplying global aerospace. Its 300 member organisations range from global aerospace players to SMEs. The MAA board comprises senior managers from Meggitt, Moog Aircraft Group, Rolls-Royce and UTC Actuation Systems, elected supply chain representatives and key regional partner bodies.



For additional copies of *Midlands Aerospace*, or to add your colleagues to the distribution database, please contact the MAA by any of the means below.

If you have a query or suggestion that you would like to make please contact the MAA.

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A three-fold strategy guides the MAA's activities.

- Sharing knowledge and information
- Delivering expert support to members
- Leading coordination of shared strategy

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www.midlandsaerospace.org.uk/join



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