

Minister for Defence Procurement's speech at the RUSI Combat Air Power Conference

2021 marks 30 years since the end of the first Gulf War. For those of us watching on our TV screens it remains the defining image of UK air power in action. We watched as our strike fighters, in tandem with our allies, gave a terrifying demonstration of precision and power. In barely six weeks the RAF had flown thousands of sorties, achieved total dominance of the skies over the Gulf and drove out Sadaam's forces and liberated Kuwait.

But, as our recently published Integrated Review underlined, technology and the threats we are facing have moved on. In the intervening decades, the likes of Russia and China have studied our strengths in the air and begun developing the capabilities to not only counter but surpass us.

So, we've witnessed Russia deploy advanced systems and develop their Anti-Access and Area Denial (A2AD) capabilities, from surface-to-air missiles to electronic attack.

We've seen China build multiple highly effective systems that challenge Western warfighting. Producing J-20 fifth generation fighters, Y-20 heavy transport aircraft, armed stealth UAVs, not to mention the world's most modern surface to air missiles.

And both countries are now exporting advanced air technologies to many North African, Middle Eastern and Asian nations. Russia has sold S-400 surface-to-air missile systems and China are selling rapidly upgradeable software-enabled radars.

Even a cursory examination of geopolitical events reveals the battlefield has changed dramatically. Iran have used drone swarms. The Houthi's have used anti-aircraft missiles. And all forces, whether forward deployed or on the home front, are conscious of the risk of discovery by Intelligence, Surveillance and Reconnaissance (ISR). That's just what's in store us today. More disturbing are the threats coming down the track.

By 2040 we imagine our air fleets will need to operate in highly contested environments where our enemies can disguise all traces of their approach. An adversary with high-end systems who can draw on Artificial Intelligence to fuse data to pinpoint their targets in an instant with minute precision. An adversary who can target us with a range of surface-to-air and hypersonic missiles that have greater manoeuvrability, greater lethality and a greater range than ever before.

And the danger is as likely to come from space as it is from cyber space. Nor should we expect it to be solely directed against the military but against our logisticians, our suppliers, our information specialists.

If we fail to outmatch these targets and they continue at this pace, we could find ourselves locked out of the skies. The freedom of the air cannot be taken for granted. We have to preserve our freedom to protect ourselves and cannot accept large parts of the world becoming potentially out of bounds.

But to safeguard our skies, highly capable threats need highly capable systems to counter them. So how should we respond? For your answer, I refer you simply to our recently published Integrated Review and the Command Paper. I don't doubt those tuning in will already know these important documents off by heart. So, let me simply highlight some salient details.

We have launched the next phase of our programme to design and deliver Tempest and I am proud to say that, over the next four years, we will invest more than £2bn as Government into a world-leading future combat air system to keep us and our allies safe alongside us, leveraging additional investment from our first rate international and industrial partners.

For me, Tempest is about three things:

First, it's about capability. In the past we put platforms first. But Tempest is much more than just a jet. This is a sixth-generation system.

A system with a virtual brain that can embrace artificial intelligence, deep learning, novel sensors and communications technologies. A system that can gather, process and exploit magnitudes more data than today. A system able to rapidly and seamlessly connect operations and share information not just in the air, on land and over the sea but in space and the cyber sphere.

This is about a system that can tap into a network of capabilities including long-range weapons, space-based sensors and directed energy and high-speed weapons. It is a system built with the open architecture that allows for constant upgrades.

And over the next five years we will be testing out a suite of new, novel technologies to turn concept into reality.

From Combat Cloud Architecture that can master a mass of data to outthink an enemy, to an uncrewed aerial aide which can fly ahead of, alongside, or on its own to lend our future fighter jet a hand.

Our £30m contract to design and manufacture the prototype for an uncrewed fighter aircraft, known as Mosquito, is supporting more than 100 jobs in Belfast. In 2023 we will be looking to conduct a flight-test programme for the demonstrator.

And it's not just the hardware but the software that will make a difference. We are developing an open mission system architecture, known as PYRAMID, to ensure software can be rapidly adapted to meet technological advances and evolving threats while saving time and money.

We are targeting this system coming online from 2035. Over time, it will replace the Typhoon as it reaches the end of its service life.

Secondly, Tempest is about ensuring we have the industrial capability of the future.

Our combat air sector is already the envy of the world. It generates £6bn a year and employs over 46,000 workers across the four nations of the UK.

But, at a time when UK civil aerospace industry is having to adapt to the difficult challenges created by COVID-19, we are now creating an unprecedented opportunity.

The chance for the biggest names in the aerospace business to come together with our brilliant SMEs and universities to develop a sixth-generation combat air enterprise. The chance to create more jobs and develop future skills. And the chance to spread prosperity the length and breadth of the UK. The very embodiment of this Government's desire to level up.

This is a programme benefitting over 300 companies nationwide which has already given more than 1,800 of our brightest and best the chance to shine with STEM apprenticeships. And through events, scholarships and apprenticeship schemes, we're engaging, supporting and funding what we're calling "the Tempest generation".

This is a programme that has spawned a growing aviation eco-system comprising multiple contracts with companies and academia.

We know that, in the past few decades, despite our successes, the Western way of procurement has not kept pace with our adversaries. So, our challenge will be to accelerate innovation and, once again, be pioneers in aviation.

'Digitising' the industry is part of that challenge. BAE's 'Factory of the Future' in Warton is already highlighting how digital twinning could contribute to the design and manufacture of Tempest systems.

By virtually designing a digital version of a physical aircraft, they've been able to use their high-performance computers to put it through its paces and work out how it performs. Getting this right will slash costs and testing time to a game-changing extent. This is transformational.

But I have no doubt the brilliant brains of scientists and engineers across the country have what it takes. They have already achieved a world first – an electrical embedded starter generator able to provide a future fighter aircraft with unprecedented levels of electrical power and thermal load.

There's a third and final aspect to Tempest that I wish to highlight today

It is not merely about strengthening our industry but bolstering our international ties.

This programme gives us a chance to work with like-minded allies to share technology, experience and R&D costs. To enhance our understanding and interoperability. And to build something that is world beating.

We've already made significant progress with our partners Sweden and Italy.

Partners who bring credible industries and great strength-in-depth design, manufacture and sensor technologies.

And we're now exploring the important corporate opportunities with Japan.

Each partner will bring a host of benefits and expertise to the table.

I've already touched on 'digitising' the industry – Saab, the industry lead for our partner Sweden, have done some great work in this field. Through digital testing of their Gripen-E, they have drastically reduced the hours and cost it would have taken to test a physical system; they're now calling it the world's most cost-effective fighter jet. I'm sure we'll be looking to learn a lot from them about the huge benefits that can be delivered by this kind of digital simulation.

Combine the technical experience of Sweden with our long-standing Combat Air partnership with Italy which has gone from strength-to-strength with Eurofighter and F-35, and potentially the world-leading manufacturing technologies being developed by Japan, on top of the world-beating qualities that I have explained the UK has to offer, and that really is a winning formula.

And we're open to other partners coming on board

Thirty years ago, the UK and its western allies appeared unchallenged in the air domain. Today our adversaries have caught up. But a major national and international endeavour is now underway.

Working with industry and with our international allies, we are aiming high. A state-of-the-art system fit for tomorrow's world. A system that matches our ambition to invest in high-tech skills, jobs and businesses. And a system that will ensure, decades from now, whenever the next conflict arises, we will stay in control of the air, winning the air-fight and protecting our peace and prosperity for generations to come.