

BAE Systems 'skunk works' forces the technology pace

Combat aircraft and UAVs, nuclear subs and aircraft carriers, armoured vehicles and air defence radars – BAE Systems is renowned as one of the world's leading suppliers of big-ticket defence equipment.

Less well known is the breadth of the work being done by the company's Advanced Technology Centre 'skunk works' on applying new and existing technologies to problems in aerospace and other sectors.

Synthetic Gecko is the name of a BAE-developed material designed to

grip ultra-tightly without glue or pressure. It's made of layers of thousands of microscopic polyimide stalks with splayed tips, closely mimicking the mushroom-headed hairs on the feet of the gravity-defying lizard of the same name. Potential applications include patches for holes in fuel tanks and aircraft skins, rapid attachment of armour panels, and personal safety harnesses.

Wind farms may prove to be part of the solution to the problem of climate change, but they can also

interfere with the surveillance radars that assure safety in busy airspace. The sweeping aerofoils of the wind turbines can interfere with radars in several ways, creating clutter and false tracks and shadowing large volumes of airspace.

Filter

BAE's answer is the Advanced Digital Tracker (ADT) – a simple add-on filter for new and existing radars that eliminates the false returns. ADT has been successfully demonstrated in trials with a mili-

tary Watchman radar and an RAF Hawk trainer carrying out high-g manoeuvres over a wind farm in Wales.

REVERB (Reverse Engineering the Vertebrate Brain) is the name of a project to create artificial intelligence for robots, allowing them to make decisions and multitask like humans. Being carried out by BAE and several British universities, the five-year project is expected to find applications in a variety of vehicles, including search-and-rescue UAVs and mine-clearance robots.

UK to assist Algeria with space plans

The British National Space Centre (BNSC) has signed a memorandum of understanding (MoU) with the Algerian space agency ASAL. It was signed by Lord Sainsbury, the UK Minister for Science and Engineering, and ASAL's Dr Azzedine Oussedik.

Algeria is keen to further develop its own space industry with special interest in telecommunications and earth observation, but needs international partners. The MoU is just one of many signed by Algeria, which include partnerships with France, Argentina, South Africa, Russia and the US.

Algeria's first satellite AISAT-1 was launched in



2002 and is part of a microsatellite constellation dedicated to disaster monitoring. The satellite was built under a knowledge transfer programme at Surrey Satellite Technology Ltd (SSTL).

Lord Sainsbury, the UK Minister for Science and Engineering (right), and Dr Azzedine Oussedik, of the Algerian space agency ASAL, sign the MoU at the show.

Collaboration is the key to space success, says ESA

International co-operation was the common theme at a forum of senior VIPs and space industry figureheads organised for Farnborough's space day.

Lord Sainsbury, the UK minister for science and engineering, was joined by Michael Griffin, NASA administrator; Jean Jacques Dordain, director general of ESA; Anatoly Perminov, head of the Russian Federal Space Agency; Kaoru Mamiya, vice president of JAXA, the Japanese space agency; and Azzedine Oussedik, director general of ASAL, the Algerian space agency.

In his opening speech Lord Sainsbury said that international collaboration is key to the future of the growing world space industry – the UK's is now worth £4.8 billion (\$6bn) and grew by 8% last year. "We are entering a golden age of planetary exploration," says Lord Sainsbury. "We will work closely with our US friends on the Exomars project and it is important that both the US GPS and European Galileo navigational satellite programmes work together too."

This cooperation was underlined by an announcement that the British National Space Centre (BNSC) has signed a memorandum of under-

standing (MoU) with the Algerian space agency ASAL. (See story left).

Jean Jacques Dordain, director general of ESA, agrees with Lord Sainsbury and says: "We cooperate with the world, including the USA, China, Japan, India. If you don't want to cooperate, don't come to ESA. No single European country could do what ESA has done on its own. Sometimes you find the best talent outside your



If you don't want to cooperate, don't come to ESA, says Jean Jacques Dordain, ESA director general.

own country. "When you are managing risky projects it is important that you have mutual trust too. For example, I trust Michael Griffin to make the right decision about launching the space shuttle, and I expect him to let me do the same with our launches."

Space makes maths and science fun

Elliot Pulham of the Space Foundation (Space Pavilion) says that space is a great way of getting school kids involved in maths and science without them even



Elliot Pulham.

realising it. The Space Foundation is a not-for-profit organisation based in the US that supports teachers and students with a range of curriculum materials. Teachers can download lessons from its website or attend a Teaching with Space conference.

"The best way to get kids to learn is to make it fun, and what is more fascinating than space?" Pulham says. "The foundation also runs masters degree programmes in space education, complete with a five-week summer institute in Colorado Springs.

"Around 100 teachers have graduated since we started running these two years ago.

Rocketry

"We work with the US Air Force Space Command and other aerospace companies to introduce teachers to themes like weightlessness training, rocketry, remote sensing and space history," he says.

And if you have kids at home call by the booth – the foundation has some cool space colouring books for younger future astronauts.

Broken nut blamed for crash

A broken nut was to blame for the fuel leak that downed a Falcon 1 rocket in March on its maiden flight, a US government review board has found. The manufacturer, Space Exploration Technologies (SpaceX), had thought that the fuel leak was caused by a tiny pipe fitting that had been left loosened following work on the rocket the previous day.

Honeywell radar for Dutch fleet

Honeywell (Hall 1, A9) is to supply the military variant of its RDR-4000 weather radar to Marshall Aerospace for two Royal Netherlands Air Force (RNLAf) Lockheed Martin C-130 aircraft. The RDR-4000's 3D scanning technology includes terrain-based digital ground clutter extraction for removing ground returns and automatic compensation for the earth curvature to present a true picture of the weather.

Shuttle night launches to resume

NASA says it will lift its self-imposed ban on night launches of the Space Shuttle, but not just yet. That was the message from NASA administrator Michael Griffin who updated space industry representatives in a stiflingly hot and packed conference room in the Space Pavilion on Wednesday.

UK aerospace strategy 'gains momentum'

A total of £131 million (\$240 million) for R&D projects has been raised through the UK's National Aerospace Technology Strategy. A progress report on the strategy was presented to ministers at Farnborough by the SBAC, which says support from the DTI Technology Programme and regional development agencies is being matched by industry partners.

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