Viewpoint

A Familiar Frontier: British Defence Strategy and Spacepower

By Dr Bleddyn Bowen

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Introduction

Spacepower's time has come. In 2018 the political, economic, and military uses of outer space – spacepower – enjoyed a level of publicity and policy attention like never before on both sides of the Atlantic. Such attention has exposed what was once a niche policy, industry, security, and military activity and academic specialism to mass media coverage and general policymaker scrutiny. Despite its being 60 years old, perhaps it is only now that wider society is realising that we are living in a Space Age, where the exploitation of Earth orbit is influencing the way we conduct politics, economics, warfare, and critical infrastructure on Earth.

It is telling that, in my scholarly disciplines of International Relations, Strategic Studies, and Intelligence Studies, the explicit and dedicated study of spacepower is still a rare specialism, especially outside of the United States. This is despite the fact that spacepower has been at the forefront of the most technically demanding military and intelligence activities throughout the Cold War and into the post-Cold War era. Today, spacepower is seemingly at the forefront of the emerging post-hegemonic international system. The proliferation of high-quality space technologies and space industrial companies continues within and across major powers such as the EU, India, and China. Several non-NATO militaries are modernising their defence industries towards space-enabled terrestrial warfare and long-range reconnaissance-strike capabilities. This viewpoint outlines my own professional views of and reflections on the shifting international context of spacepower as MOD personnel will surely engage with policy and strategy in space more as the years progress. The military services will require more space-literate personnel to implement the DSS and provide the necessary spacepower support to UK and allied missions, as well as critical infrastructure resilience.

British spacepower

The story of British spacepower has been one of integration, characterised by a binary system between Europe and America.[1] In the world of intelligence and military satellites, the UK has integrated itself into American space systems with its *Skynet* communications satellite constellation being an exception to this rule. Scientifically, commercially and industrially, the UK's space activities have integrated into the European system – through the European Space Agency (ESA) and the EU for the most part. In the last 20 years, the EU has become a more significant hard power, or security actor, in space. Britain looks set to lose influence on the one side due to Brexit, and the UK may seek to reduce its dependency on the other through the pursuit of new defence assets in space. At present, both sides of the Atlantic are witnessing significant changes with Trump's reorganisation of space in the Pentagon and the EU's desire to set up a new EU space agency alongside ESA and the rupture of Brexit. This binary system and how Britain has long been integrated in both of them should condition any discussion on UK space strategy and defence policy.

Following the founding of the UK Space Agency (UKSA) in 2010 to coordinate industrial and scientific space activities, Whitehall has increased the prominence of space policy for decision-

makers. 2013 saw a revision of the RAF's AP 3000 doctrine into the Joint Services JDP 0-30 Air and Space Power Doctrine, where air and space were conceptually separated for the first time. 2014 and 2015 saw the first ever UK National Space Policy and National Space Security Policy, respectively. 2017 saw the second edition of JDP 0-30 which expanded on several aspects of the first, fleshing out more basic assumptions of the MOD's principles in space.[2] For many years, the UK has been participating in the United States' Schriever space wargames, with allied states becoming increasingly prevalent within them. 2018 saw the signing of the UK Space Industry Bill into law, creating a framework for further commercial space legislation. 2018 also saw two significant and unresolved events: the first was the very public rupture of UK space policy with regard to the EU's Galileo satellite navigation programme, and the first hints of the contents of the MOD's Defence Space Strategy (DSS).

In Spring 2018, the procurement competition for the next phase of Galileo satellites – the EU's global navigation satellite system (GNSS) – was due to be finalised in a European Space Agency (ESA) Ministerial Council. As a result of Brexit, British companies were no longer allowed to bid for the contracts to develop the systems involved in Galileo Public Regulated Service (PRS), which is Galileo's secure and encrypted high-precision signal which is only available to approved EU state security and military users. Although implemented by ESA, Galileo is an EU-funded project. As British-based companies, which had to date led the work on the navigation payloads of the Galileo satellites, would soon be outside of the EU, EU security regulation and space industrial policy was clear that any significant contracts and security-relevant work could not go to companies outside of the EU. The former UK Defence Secretary, the Right Honourable Gavin Williamson MP, decided to contest this in public with the support of 10 Downing Street by supporting the notion of a UK replacement programme for Galileo and threatening to block EU access to UK terrestrial sites for ground support,[3] whilst other government departments threatened to withhold important ongoing work from the EU.[4]

Though there is considerable doubt as to the feasibility, desirability and opportunity costs of building a replacement system for Galileo, it has put UK spacepower and the importance of the UK's satellite industry on the political map and in the public consciousness. I have critiqued the UK's stated desire to seek a GNSS programme of its own elsewhere, including providing oral testimony to the UK House of Commons Exiting the EU Select Committee.[5] The Galileo replacement decision – which seemingly has pre-judged the outcome of the £92m 'feasibility study' – is the opposite of what rational and responsible space capability planning should be. The MOD is likely to still have access Galileo's PRS as intended in future, and on the same level of passive usage as the MOD has done with the American GPS military signal since the late 1980s. Michel Barnier, the EU's chief Brexit negotiator, has stated that subject to a functional agreement, the MOD may be able to access PRS signals.[6] British belligerence during the procurement rounds at ESA last year may have helped accelerate the EU's plans to finally set up a rival space agency from the core of the European GNSS Agency (GSA). The EU currently contracts ESA to implement its major space projects and policies and the EU may seek to

further limit ESA's decision-marking power over EU-funded and ESA-implemented projects.[7] Regardless of the future trajectory and form of European space integration, Galileo became front-page news in the context of Brexit, and the issue of the lack of sovereign UK spacepower in several areas became talking points in mainstream media.

It was already high time that Britain considered whether it needed to expand its sovereign space capabilities and provide public investment to support the UK's niche strengths in the global space economy – small satellites and downstream applications. The considerations and choices facing the MOD, and in particular in the DSS, would be virtually the same even if Brexit was not happening. Such gaps in capability and strategic planning pre-date Brexit by many years. The DSS is expected to outline a focus on expanding the MOD's capability in space-based ISR and other tactical and operational space systems for deployed military forces on Earth. Recently, the MOD has invested funds into Carbonite-2, (a live video ISR small satellite in low-Earth orbit), NovaSAR, (a synthetic aperture radar small satellite), and has released tenders for Project Oberon which is another synthetic aperture radar satellite programme. The UK Government is also supporting a small-satellite vertical and horizontal space launch capability for Sun-synchronous and polar orbits from UK territory, yet the £50m set aside for this task is smaller than the 'feasibility study' for a Galileo replacement system.

Often these new investments are described in the media as linked to, or in spite of, the Galileo-Brexit debacle. But the reality is that these capabilities simply are not the same and many within the space security community in the UK have been calling for British ISR space capabilities and small-satellite spaceports for many years. Seeing these decisions as making up for the withdrawal of the UK from the EU's space programme is making a virtue out of necessity. Even if Britain were to remain a member of the EU and a leader in its GNSS technology, there would still be a persuasive case for British investments in small-satellite and ISR assets. British space-based ISR would be able to provide new capabilities as a priority for UK military needs without having to rely almost totally on allied assets as it currently does, and unlike navigation signals, friendly ISR assets can be overburdened with excessive tasking and British needs can be pushed down the priority list for allied ISR tasking and analysis. This will be increasingly true as British allies increasingly modernise their own forces to become even more dependent on space systems, reducing the amount of 'bandwidth' available for allies on-demand. In addition, if the MOD and British intelligence agencies were to become major clients of the UK small satellite space industry (coupled with the potential for a small-satellite vertical spaceport on UK soil), this new stream of revenue would likely stimulate a very successful British industry and could help generate a new virtuous circle for the industry. A stable stream of launch requirements from the UK's defence and security organs would help build a market base for UK space launch services. Unfortunately, such possibilities are absent in the current iteration of the Government's Industrial Strategy.

In all its endeavours, the British military cannot do without space support. When considering likely deployments, involving naval power projection, aerial bombardment and close air

support, as well as light infantry and ground operations, space systems are only going to become more relied-upon as the MOD attempts to make up for a lack of terrestrial platforms and units with better efficiency and information dominance. Lighter Special Operations Forces (SOF) would be extremely reliant on spacepower for their survivability, mobility, coordination and efficiency, making up for their low numbers and depth, particularly in engaging with unmarked or proxy militias in low-intensity conflict. The DSS, if it brings about new space-based ISR for the UK, will have implications for the intelligence agencies as well. Convincing the intelligence agencies to buy into the systems may be necessary. For example, GCHQ consumed most *Skynet* bandwidth during the Cold War, especially before the advent of fibreoptic transatlantic cables. Like *Skynet*, a British ISR capability could provide London with more secure channels of support and information from space for covert intelligence and special forces operations further afield, independent of friend and foe alike.

The direction of travel in the UK is for more space capabilities, not fewer. Yet spacepower, like any major capability and geostrategic environment, requires a large coalition of stakeholders to provide the direction and funding to realise their benefits, beyond individual parliaments and cabinets. A key problem for Britain to address, regardless of the exact capabilities invested in and which dependencies are to be accepted, is the recruitment of personnel with the necessary technical skills and intelligence analysis brainpower. There is a general shortage of science, technology, engineering, and mathematics (STEM) graduates, and the MOD must not only face this issue but also compete with the attractiveness of working for the intelligence agencies and the commercial space industry.

Any major investment in British space capabilities, whether in space or on the ground such as with dedicated space radars for enhanced space situational awareness (SSA) capabilities, will require functional demarcations of responsibility within the MOD and across the intelligence agencies. The MOD's space capabilities and responsibilities are currently discharged across the RAF, Joint Forces Command (JFC) and Defence Science and Technology Laboratories (DSTL). These entities will also need to clarify their relationship with UKSA, particularly if Britain wants to retain an ostensibly civilian face in space and to provide some degree of a cordon sanitaire between civilian space science and commerce and the military-industrial complex. In addition to deciding who should 'do space' in the MOD and across the organs of the British state, the integration of such new assets and personnel will need to also look outward into the allied and Five Eyes relationships. Britain has traditionally relied on others for the bulk of its space capabilities – it is only reasonable to return the favour to our allies, especially the United States, and consider how best to make Britain in space useful to its friends.

Space Force and the international context

Across the Atlantic, President Donald Trump has decided to focus some of his energies on the reorganisation of the US military space bureaucracy. He has championed the notion of an independent 'Space Force' as a sixth branch of the US military and will re-create the US

Space Command as a new combatant command on the same level as the other geographic commands and US Strategic Command – essentially undoing the Bush administration's changes in 2002. The latest space policy directive from the White House has seemingly reduced its ambitions and effectively requested that Congress legislate for what bipartisan consensus already had been pushing towards for many years in the House of Representatives, under the advocacy of Representative Mike Rogers – a 'Space Corps' within the US Air Force to have the same degree of autonomy as the Marine Corps does within the US Navy's architecture. However, it is still referred to as Space Force in writing, which disguises its non-independent nature. Regardless of the form, Congress must still legislate for a Space Corps or Force to come about. It is not yet a foregone conclusion as there is considerable hostility within the Senate towards any more independent space cadres within the Pentagon.

At the time of writing, it is still unclear what problem a new Space Corps or Force, and a US Space Command, is trying to solve. There are good reasons for considering a space-orientated service, as I have argued elsewhere.[8] But the Trump administration is tight-lipped as to their rationale for a new service. Claims of Chinese and Russian threats are valid – but these are chronic rather than acute threats. There is no explanation of how the Pentagon has failed to address these issues satisfactorily due to the current organisational structure of US military space. Indeed, Chinese and Russian modernisation are beyond the control of any US military service. There are also complaints that go back decades that the US Air Force does not allow military space culture to develop, or underfunds its space mission, or that the current acquisitions and procurement processes for space are not fit for purpose.[9] Another front in this changing bureaucratic landscape is the new Space Development Agency. Though details are scant at present, it is meant to allow the Pentagon to tap into off-the-shelf space technology and assets in a much faster fashion than current procurement procedures allow with built-to-order space systems, similar to the UK MOD's hopes with small-satellite ISR capabilities using commercial technologies.

These complaints or rationales for reorganisation are not debated in any depth in public – particularly as issues over procurement remain highly classified – and therefore communicating and justifying a Space Force or Corps to Congress and the electorate may be a challenge without getting into the detailed rationales for setting up a new service. The Trump administration must explain what does not work in the current set-up – and by a matter of course will have to criticise the US Air Force's stewardship of American spacepower in the process. This complicates the USAF's life-long effort to retain majority control of US military space and its budget. At the time of writing, there are no new major acquisition programmes beyond long-running capability modernisation and incremental improvements in the US military space community. Discussion of a Space Force should therefore not become bogged down in discussion of US space weapons policies and doctrines. The 'space warfighters' of the US military are, after all, personnel watching computer monitors in windowless bunkers and facilities, responsible for the optimal utilisation and deployment of American space-based infrastructure. Whatever the form the new mould of American spacepower is set, the UK, Five

Eyes states, NATO and Asia-Pacific allies will have to ensure they remain well-integrated within it. The Space Force will mostly be about support to warfighters, not warfighting itself.

A serious discussion of how best to organise military spacepower, and which sorts of assets are required, is a welcome and necessary one on both sides of the Atlantic. China and Russia have either deployed or re-activated kinetic anti-satellite (ASAT) weapons programmes and continue to modernise their terrestrial military forces with supporting space infrastructure which mimics American successes with so-called 'net-centric' or precision warfare since the 1990s. As China and Russia become greater threats in space for space-enabled military forces, they themselves are becoming dependent on space systems for their long-range strike, surveillance, and command and control capabilities. Space is therefore an increasingly target-rich environment for any state seeking to employ soft (e.g. electronic warfare, computer network attacks) or hard kill (e.g. kinetic or explosive) ASAT weapons during a time of open hostilities.

Over 70 states are significant stakeholders in space, with their own space infrastructure and capabilities that are deployed for their own mix of objectives for war, development and prestige. Not least among these are European states and the EU, India, Japan and Israel. With so many states and a myriad of private actors using space, there is an increasing need for international regulation on how to establish 'normal' everyday behaviour and standard operating procedures in space that minimise the risk of accident and unintentional harm or interference. The previous drive at this effort – the EU's International Code of Conduct for Space Activities, is currently in the doldrums of the UN's General Assembly.[10] Despite this stalled effort, there is an increasing desire among some in the private sector and many states for some form of standardisation of behaviour in outer space, particularly in the guise of a space traffic management system. If successful, this will have a far-reaching impact on the way humanity uses Earth orbit and will steal the diplomatic initiative and momentum away from Russia and China's stalled space weapons ban proposal, the PPWT.

Britain must find its place in this evolving diplomatic, strategic and economic landscape. Britain can contribute much for global governance debates on these issues, particularly if it is set on increasing its sovereign space capabilities. A possible area for Britain to gain leverage in these discussions is to invest in SSA capabilities, going beyond RAF Fylingdales and developing essential SSA data that any space traffic regime will need. As well as being necessary for British intelligence and security needs, it would be useful for wider diplomatic and 'good citizen' duties in the global space community by sharing space tracking data. This raises another issue for the UK's future planning in space if it were to pursue more capabilities with regard to the division of responsibilities. Whether or not the military is the best place for a greater British SSA capability is an open question. Traditionally, SSA data is often not as transparent or timely when controlled by the military, and especially if integrated in the American Space Surveillance Network as current British SSA capabilities are via RAF Fylingdales and RAF High Wycombe.

A dedicated civilian UK SSA may be able to provide more flexibility over the data and its sharing to suit London's diplomatic interests as the EU itself seeks to increase its own SSA network.

Conclusion

British space is going through many changes and has never faced as much public and government attention as before. Yet the same is true of the global astropolitical landscape. Spacepower is proliferating horizontally and vertically, with an increasing number of middle and small powers investing in space technology for the needs of war, development and prestige. British economic successes in space are not guaranteed to continue, and will face an increasingly competitive global space market. There are increasing threats to UK assets in space, and for terrestrial military forces which depend on space, which makes for a potentially bright future for space defence acquisition in the years ahead. Whether new defence assets should be procured off-the-shelf, designed in-house, or new standards of hardening against jamming, spoofing and cyber-intrusions imposed on UK space industry are decisions that Whitehall must make soon. Britain needs to discuss carefully where to invest in capabilities and personnel, and where to rely on and integrate with others. Most importantly, Britain will have to consider how it fits into the binary system of US and European spacepower, as the old historical balance may no longer work given Europe's increasing military space capabilities.

Space is a rather familiar frontier: Britain will continue to struggle to come to terms with the perennial problems of a budget that never meets its lofty rhetoric. Resources are scarce not just in finances, but in personnel. The Space Age is full of promises, and despite access getting easier, the international competition over profit and security in space will increase demands on Britain to keep pace with the larger and comparable economic powers of Earth. Britain's space ambitions have to meet its capacities and hard decisions need to be made on which niches are worth investing in, and where dependencies and allies are indispensable, and not engage in projects of national vanity. Such an argument is not new in discussion of British defence policy and grand strategy, that what we do in space is determined by and reflects upon politics, economics, and strategy on Earth;[11] space warfare is the continuation of terrestrial politics by other means.

Notes

[1] Bleddyn E. Bowen, 'British strategy and outer space: A missing link?', *British Journal of Politics and International Relations* 20:2 (2018) 323-340.
[2] Bleddyn E. Bowen, 'The RAF and UK Space Doctrine: A Second Century and a Second Space Age', *RUSI Journal* 163:3 (2018) 58-60.
[3] Andrew Williams. 'Could Britain collaborate with Australia on a Galileo alternative?', *Space News* 24 May 2018 **https://spacenews.com/could-britain-collaborate-with-australia-on-a-galileo-alternative/** (accessed 08/05/2019).
Ashley Cowburn, 'Gavin Williamson threatens to block EU facilities for 'rival' satellite projects after Brexit', *The Independent*, 2 October 2018 **https://www.independent.co.uk/news/uk/**

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[4] Peggy Hollinger, 'UK could withhold security clearances for companies working on Galileo', *Financial Times*, 14 May 2018, https://www.ft.com/content/ddc0b98e-5782-11e8-bdb7-f6677d2e1ce8 (accessed 08/05/2019).

[5] For example, see: UK House of Commons Exiting the EU Select Committee, 'Oral Evidence: The Progress of the UK's negotiations on EU withdrawal HC 372, Wednesday 9th May 2018', http://data.parliament.uk/WrittenEvidence/CommitteeEvidence.svc/EvidenceDocument/Exiting%20the%20European%20Union/The%20progress%20of%20the%20UK%E2%80%99s%20negotiations%20on%20EU%20withdrawal/oral/82783.pdf (accessed 15/03/2019) From question 1634 onwards; Andrew Williams, 'Could Britain collaborate with Australia on a Galileo alternative?', *Space News*, 24/05/2018, https://spacenews.com/could-britain-collaborate-with-australia-on-a-galileo-alternative/ (accessed 15/03/2019).

[6] Francois Murphy, 'Britain could access but not develop European GPS, says Barnier', *Reuters*, 19 June 2018. https://www.reuters.com/article/us-britain-eu-galileo/britain-could-access-but-not-develop-european-gps-barnier-says-idUSKBN1JF190 (accessed 08/05/2019).

[7] Council of the European Union Proceedings 7481/19, 13/03/2019, 16. https://data.consilium.europa.eu/doc/document/ST-7481-2019-INIT/en/pdf (accessed 15/03/2019).

[8] Bleddyn E. Bowen, 'Space warfare in the Pentagon: In support of an independent Space Corps', *Defence-in-Depth*, 24/06/2017, https://defenceindepth.co/2017/06/24/space-warfare-in-the-pentagon-in-support-of-an-independent-space-corps/ (accessed 15/03/2019); Cameron Hunter and Bleddyn E. Bowen, 'Donald Trump's Space Force isn't as new or as dangerous as it seems', *The Conversation*, 15/08/2018, https://theconversation.com/donald-trumps-space-force-isnt-as-new-or-as-dangerous-as-it-seems-101401 (accessed 15/03/2019).

[9] Michael V. "Coyote" Smith, 'America needs a space corps', *The Space Review*, 13/03/2017, http://www.thespacereview.com/article/3193/1 (accessed 15/03/2019).

[10] Michael Krepon, 'Space Code of Conduct Mugged in New York', *Arms Control Wonk*, 04/08/2015, https://www.armscontrolwonk.com/archive/404712/space-code-of-conduct-mugged-in-new-york/ (Accessed 15/03/2019).

[11] Bowen, 'British strategy and outer space...' 323-330.