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Securing the orbital flank:

Towards a new strategy for British spacepower

By *Gabriel Elefteriu FRAeS*

New geostrategic thinking for a more competitive age
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Foreword

The key message in this excellent and timely research paper is that we should build our space capacities around a concept of five-domain, warfighting resilience; one that includes them by design and allows for their degradation under repeated attack. No longer can we buy from, or more likely borrow off, our allies space-based capabilities designed for a previous era – one where only superpowers could reach into space, and with a mindset that had placed space above conflict and war.

Space has been democratised. It is not just Elon Musk, Founder and Chief Executive Officer of SpaceX, who has rewritten the economics of operating in space; capabilities, both in imaging and communications, once open only to very rich and technically capable states, now feed your iPad. It is getting crowded up there, and as is well known, crowds and mobs contain ne'er-do-wells and pickpockets...

But we should not now go too far the other way, and declaim 'woe is us' as satellites are hard to hide and ripe to be picked off. What can we do? Well, quite a lot, it turns out, if you analyse the space domain as you would any other and look at the strengths and weaknesses of all parties. As ever, making yourself a hard target, building in much redundancy, and increasing costs on your enemy's ability to operate or cross you are as possible in space as in any domain. Getting the balance right in how you invest here will be the difference between success and failure at a systemic level.

Reading this Report is as good a way as any of getting to grips with these urgent questions and the options we should consider in answering them.

Air Mshl. (rtd.) Ed Stringer CB CBE

Director General, Defence Academy of the United Kingdom (2018-2021)
Assistant Chief of the Defence Staff (Operations) (2015-2018)
Assistant Chief of the Air Staff (and SRO for Space), Royal Air Force (2013-2015)

Executive summary

CONTEXT

- The space domain has seen substantial transformation since the publication of the 2022 Defence Space Strategy (DSS). Russia's full-scale invasion of Ukraine, the rapid growth of the People's Republic of China's (PRC) military space capability, expanding Russian counterspace activity, and a sharper-edged American warfighting doctrine are making spacepower both more important to terrestrial combat and more actively contested.

- Increasingly, the United Kingdom's (UK) policy has recognised this shift. The 2025 Strategic Defence Review (SDR) described space as 'central to warfighting'; the 2026 Defence Investment Plan (DIP) characterised it as the 'central nervous system of modern, high-intensity warfare'; the 2026 UK Space Strategy established a formal 'Control of Space Requirement'; and the Royal Air Force (RAF) has stood up No. III Space Effects Squadron. In practice, however, the existing British defence space capability portfolio still reflects the older view of space as a mere collection of enabling services to a significant extent.

- This matters because the Integrated Force that is being designed for the 2030s will be increasingly networked, autonomous – including the New Hybrid Navy – and oriented towards Deep Precision Strike (DPS), advanced missile defence, and rapid sensor-to-shooter cycles enabled by the future Digital Targeting Web (DTW). The military effectiveness designed into the Force will therefore increasingly depend on assured access to the orbital layer – with all the requirements pertaining to space resilience – and on new sets of space effects.

QUESTIONS THIS REPORT ADDRESSES:

- How has the overall relationship between spacepower and terrestrial warfare changed since the publication of the UK's 2022 DSS?
- To what extent is space becoming a core part of contemporary (and future) military power rather than simply an enabling domain?
- How effectively could the British Armed Forces continue to operate on the battlefield if satellite communications; Precision, Navigation, and Timing (PNT); orbital Intelligence, Surveillance, and Reconnaissance (ISR); and other space-derived effects were seriously degraded or denied?
- What capability categories and strategic priorities should guide British military spacepower planning over the next decade, in conjunction with the build-out of the Integrated Force?

KEY FINDINGS

- **Space is moving from 'add-on' to 'built-in'.** Advanced military forces increasingly organise sensing, communications, targeting, and weapons employment around space-mediated architectures. The clearest examples include persistent ISR, long-range kill chains, autonomous systems, and advanced missile warning and defence.
- **This dependency is important but not absolute.** For example, ships carry organic sensors such as radar; aircraft can use tactical radiofrequency data links; land forces can often rely on local Uncrewed Aerial Vehicles (UAVs) and terrestrially deployed communications; and many long-range weapons are equipped with inertial or other alternatives to satellite navigation. The British Armed Forces could therefore technically continue to fight even under substantial space denial.
- **The more important question is what would be lost, and therefore what risks would arise.** Space denial would progressively reduce range, tempo, precision, awareness, connectivity, and operational

integration across domains and different types of units. The future Integrated Force could still 'fight', but much of the capability now being designed into it would no longer be available in its intended form. It would also become much more vulnerable against an adversary that did retain its own space advantage.

- **Dependence varies substantially by mission.** It is least absolute in tactical land warfare, where terrestrial substitutes – especially in communications – are within easier reach, and becomes progressively more important as forces operate over greater distances. This particularly affects island nations such as the UK, which are oriented towards expeditionary warfare. Maritime warfare, long-endurance remotely piloted aircraft, DPS, and advanced missile defence therefore generate particularly demanding space requirements.

- **The orbital layer is becoming more vulnerable at the same time as it becomes more valuable.** Space architectures can be attacked through their ground, link, and orbital segments using cyber operations, Electronic Warfare (EW), physical attack, and increasingly sophisticated co-orbital capabilities.

- **The critical task of improving British space resilience must consequently be understood at architecture mission level, as the preservation of military effects, rather than simply protection of nationally owned individual satellites.** This requires dispersed and protected ground infrastructure; substitution pathways; integration of sovereign, allied, and commercial systems; and increasingly the ability to reconstitute lost capability.

- **Passive resilience alone, such as hardening and fallback systems, will become insufficient against an adaptive counterspace threat.** With the proliferation of Rendezvous and Proximity Operations (RPO) spacecraft, highly manoeuvrable satellites, and a variety of counterspace systems, the UK will increasingly require space control and orbital warfare capabilities able to protect friendly systems and, when necessary, attack adversary architectures. The present British space capability base does not yet match these requirements.

- **Planned investment is not insubstantial, particularly after 2030, but the UK continues – and, on present plans, will continue – to lack sovereign depth.** This includes persistent ISR (across different types of sensing), missile warning and tracking, resilient space-based PNT, rapid orbital reconstitution (especially space launch), and high-performance orbital manoeuvre capabilities.

- **Key European countries appear increasingly able to supplement British and American capability, but they cannot replace the United States' (US) space support within the present planning horizon out to 2035-2036.** The UK's strategy should therefore seek a form of sovereign interoperability – i.e., ways to pool capabilities safely with allies, primarily via North Atlantic Treaty Organisation (NATO) initiatives – rather than either full strategic independence or one-way dependence.

RECOMMENDATIONS

To prepare for the space domain challenges of the next decade, His Majesty's (HM) Government should:

1. **Reorient defence space planning around warfighting**, with a focus on how spacepower generates and preserves combat advantage for the Integrated Force in the 2030s.

2. **Define the Integrated Force's actual space requirements** and establish specific mission-continuity standards for resilience planning.

3. **Accelerate a national capability core** around ISR and Electronic Intelligence (ELINT), protected multi-orbit Satellite Communications (SATCOM), missile warning and tracking, and space control capabilities.

4. **Design new architectures to survive attritional space warfare**, incorporating diversified providers and orbits, resilient ground infrastructure, reconstitution, and commercial substitution.

5. **Develop a credible orbital warfare capability**, both to defend British orbital systems and to hold adversaries' space architectures at risk.

6. **Recast the alliance model around sovereign interoperability**, exploiting new technologies, through wider NATO initiatives and separate allied architectures.

7. **Treat the National Space Enterprise as part of warfighting resilience**, including industrial capacity, launch access, workforce, infrastructure, and the ability to regenerate capability.

1.0

INTRODUCTION: A NEW SPACEPOWER AGE

The rapid evolution of the military space domain is straining the United Kingdom's (UK) defence establishment's efforts to respond to its implications. Defence planning and space strategy-making now has to account for a space environment shaped by accelerating technological change, expanding military use – in both type and scale of operations – and growing strategic competition against a fast-moving space threat picture. At the same time, Britain has embarked on a major redesign of its armed forces around more ambitious and complex concepts of integration, autonomy, long-range strike, and information advantage. Thus, the principal question is what kind of military spacepower will the UK require over the next decade, and why? First, it is useful to establish how far the strategic context has moved since Britain first formalised its strategic approach to defence space in 2022.

1.1 What changed after 2022?

Since the publication of the UK's first Defence Space Strategy (DSS) in early 2022, the outlook and impact of military spacepower have undergone a major transformation. Although the DSS recognised space as an operational domain, its conceptual centre of gravity remained fixed in a traditional understanding of space as a key 'enabler' for defence operations, its strategic mission being to provide communications, intelligence, navigation, and missile warning to the Joint Force.[1] The

[1] 'Defence Space Strategy: Operationalising the Space Domain', Ministry of Defence, 01/02/2022, https://www.gov.uk/ (checked: 09/11/2026).

intervening four and a half years of high intensity conflict in Ukraine, together with major technological and capability developments in the space domain over this period, have moved the argument considerably further.

For Kyiv's forces, Starlink quickly became central to battlefield command and control. As early as 2022, the United States (US) Pentagon acknowledged that the capability provided by Starlink – as the only available system of its kind – had proved 'exceptionally effective' from the tactical to the strategic level.[2] Further space support – communications, imagery, and other data, supplied at unprecedented scale – has been, and continues to be, provided by a variety of commercial and government space systems.

Russia, too, has evolved its military-space posture, adding new orbital Electronic Intelligence (ELINT) systems such as Lotos-S1,[3] new radar imaging and communications satellites,[4] and continuing to modernise the Global Navigation Satellite System (GLONASS), its satellite navigation system. However, the most concerning Russian development has been an expansion of its counterspace capabilities and activities, ranging from ground-segment attacks at the start of its full-scale invasion of Ukraine to a possible space-based nuclear weapon.

In parallel, the People's Republic of China (PRC) has been rapidly building up an increasingly formidable space layer for its own long-range targeting architecture: in 2024 alone, it launched 67 satellites equipped for Intelligence, Surveillance, and Reconnaissance (ISR) missions, bringing the total number of this class of Chinese spacecraft in orbit to more than 500. The US military's unambiguous assessment is that a key purpose of these systems is to track and target American and allied forces across the Pacific theatre.[5]

Inevitably, space doctrine has hardened as well – effectively, over a single command cycle – in response to these transformations. The US Space Force has spearheaded this shift, culminating in 2025 with declaring space superiority a precondition for Joint Force success and

[2] 'Senior Military Official Holds a Background Briefing on Ukraine', United States Department of War, 14/10/2022, https://www.defense.gov/ (checked: 09/11/2026).
[3] 'Launch of Cosmos-2580, a Lotos-S1 electronic reconnaissance satellite', Russian Strategic Nuclear Forces, 04/12/2024, https://russianforces.org/ (checked: 09/11/2026).
[4] 'Instrument: SAR-10', World Meteorological Organisation, 27/11/2023, https://space.oscar.wmo.int/ (checked: 09/11/2026).
[5] 'Annual Report to Congress: Military and Security Developments Involving the People's Republic of China', United States Department of War, 23/12/2025, https://media.defense.gov/ (checked: 09/11/2026).

formally organising counterspace operations around orbital, electromagnetic, and cyber warfare.[6] Recent operations have evidenced this fact in practice, as recognised in official statements describing the fundamental role played by space effects from the American extradition of Nicolás Maduro, President of Venezuela, in January 2026 to its ongoing conflict with Iran.[7]

Britain's response to these evolutions has been commendable, at least on the level of official rhetoric, conceptual framing, and stated intent. The 2025 Strategic Defence Review (SDR) described space as 'central to warfighting'[8] while the 2026 Defence Investment Plan (DIP) went correctly and boldly further, calling it 'the central nervous system of modern, high-intensity warfare' – rather than merely a supporting domain, which had been His Majesty's (HM) Government's longstanding view of space.[9]

The UK Space Strategy, published in September 2026, broke new ground by establishing, for the first time, a 'Control of Space Requirement',[10] followed by the formation of No. III Space Effects Squadron,[11] as well as public remarks by Air Chf. Mshl. Sir Harv Smyth, Chief of the Air Staff, declaring that 'UK defence is now developing capabilities for orbital warfare.'[12] In other words, even HM Government's official language has now recognised that the world has arrived at a point of historic change in how space systems and the generation of military power relate to each other. This new era demands new strategic thinking on space.

[6] 'Space Warfighting: A Framework for Planners', United States Space Force, 02/03/2025, https://www.spaceforce.mil/ (checked: 09/11/2026).
[7] 'Presentation to the House Armed Services Committee Subcommittee on Strategic Forces', United States Space Command, 17/03/2026, https://www.spacecom.mil/ (checked: 09/11/2026).
[8] 'The Strategic Defence Review 2025 – Making Britain Safer: Secure at home, strong abroad', Ministry of Defence, 02/06/2025, https://www.gov.uk/ (checked: 09/11/2026).
[9] 'The Defence Investment Plan,' Ministry of Defence, 30/06/2026, https://www.gov.uk/ (checked: 09/11/2026).
[10] 'UK Space Strategy', UK Space Agency, 08/09/2026, https://www.gov.uk/ (checked: 09/11/2026).
[11] 'RAF Launches First Ever Space Squadron', Royal Air Force, 23/09/2026, https://www.raf.mod.uk/ (checked: 09/11/2026).
[12] Sir Harv Smyth, Speech: 'Chief of the Air Staff, Air Chief Marshal Sir Harv Smyth's speech at the UK Space Power Conference', Ministry of Defence, 23/09/2026, https://www.gov.uk/ (checked: 09/11/2026). This effectively brings orbital warfare into the British military lexicon, as previous Council on Geostrategy research has urged. See: Gabriel Elefteriu, 'Embracing orbital warfare', Council on Geostrategy, 15/07/2026, https://www.geostrategy.org.uk/ (checked: 09/11/2026).

1.2 The proposition: From enabler to central nervous system

At the heart of this new approach, which should inform British defence space strategy-making going forward, should be the simple proposition that space must now be understood not merely as an adjunct, enabling domain that makes militaries more 'effective' and gives them a battlefield advantage, but as a constitutive, fundamental element of the way that advanced armed forces are designed to fight. This is the shift from space as an 'add-on' to space as 'core' and 'built-in'. Increasingly, with the growing adoption of distributed autonomous systems, Deep Precision Strike (DPS), and advanced missile defence, the Joint Force itself is being organised around space-mediated sensing, connectivity, and targeting. In many such cases, space makes these next-generation military functions possible in their intended form rather than simply enhancing their capabilities and operational profile. Again, it has been the US Space Force that redefined this point with full clarity in 2025, when it recognised that space operations have now become the 'backbone of the Joint Force', breaking away from the older conception of space as a collection of supporting services.[13]

As always with major conceptual shifts and step-changes in the professional understanding of major aspects of modern warfare, there is a danger of overstating the case. Perhaps the most important challenge, therefore, is achieving a balanced appreciation of the real scope and impact of the posited transformation of spacepower. Space is not uniquely indispensable to every military function, nor is it completely impossible to fight 'without space'. Rather, the real question is how much range, tempo, precision, awareness, and operational coherence armed forces lose when their space layer is degraded or denied – that is, when their 'orbital flank' fails? This Report tests the proposition against contemporary warfare and the actual design – and prospective development – of the British Armed Forces.

[13] 'Space Warfighting: A Framework for Planners', United States Space Force, 02/03/2025, https://www.spaceforce.mil/ (checked: 09/11/2026).

2.0

THE ORBITALISATION OF WARFARE

The established understanding of the contribution of space-based capabilities to terrestrial military operations is that of separate, well-defined, satellite-provided services: communications, sensing, navigation, and so on. However, the growing importance of spacepower for contemporary and future warfare derives from the new ways in which orbital systems are now able to connect these functions, especially for the targeting and employment of new types of long-range weapons in operations that are increasingly conducted over greater distances in highly dynamic battlespaces, through rapid-cycling kill chains. The accelerating sophistication of military technology leaves little time for human or organisational friction, and space has become the vital tissue holding together the architecture of multi-domain combat power.

2.1 Persistent observation: Towards a transparent battlespace

The first and most recognisable step-change in spacepower over the past few years concerns the ability to find the enemy. Despite some of the sensationalist language sometimes encountered in public debate, space has not yet made the battlefield 'transparent': factors including weather, terrain, camouflage, deception techniques, or emissions control continue to matter greatly. What orbital sensing does offer – although not for every point on the globe yet, but certainly as a demonstrated possibility in priority geographies – is persistent access and surveillance across large areas without having to penetrate defended airspace, and increasingly

through multiple phenomenologies (i.e., types of sensor measurements or physical signatures being collected).

The PRC, for example, is beginning to combine the kind of resolution hitherto associated only with Low Earth Orbit (LEO) reconnaissance, with ISR platforms now positioned in Geosynchronous Earth Orbit (GEO). Its Yaogan-41 satellite, launched into GEO in 2023 and positioned to cover much of the Pacific and Indian oceans, is thought to be able to identify and track objects approximately the size of a car.[14] Another key Chinese ISR spacecraft in GEO, also launched in 2023, is Ludi-Tance 4 01A[15] (innocuously, 'Land Survey' in translation) – the world's first geosynchronous L-band Synthetic Aperture Radar (SAR) satellite, with a 20 metre resolution, persistent regional access, and all-weather day-and-night coverage.[16] Used in a multi-orbit network together with higher-resolution LEO satellites, such GEO-based optical and radar systems offer a particularly powerful military combination: persistent wide-area detection from the ultimate orbital 'high ground' to cue more precise sensors onto moving naval and air targets.[17]

Russia has now fallen well behind this standard, but it nonetheless continues to adapt and improve its own space ISR lineup. In other words, its ability to sense the battlefield is growing, not diminishing. One of its key architectures, for example, is the Liana naval reconnaissance constellation, which combines Lotos-S ELINT satellites – expanded since 2022 – with Pion-NKS SARs. Recent years have also seen the Kremlin deploying a series of small LEO optical ISR satellites, apparently operating in formation to increase coverage, while the dual-use Kondor-FKA spacecraft provide SAR imagery at up to 1-2 metre resolution.[18]

Notably, Russia has also begun to acquire military-capable ISR satellites from the PRC, such as the 0.5 metre resolution Stilsat-1 – a demonstrator built and launched by the PRC in 2024 under the original name of Taijing-3-02, but now operated by Russia and thought to be

[14] Clayton Swope, 'No Place to Hide: A Look into China's Geosynchronous Surveillance Capabilities', Centre for Strategic and International Studies, 19/01/2024, https://www.csis.org/ (checked: 09/11/2026).
[15] 'Satellite: Ludi-Tance 4 01A', World Meteorological Organisation, 01/09/2025, https://space.oscar.wmo.int/ (checked: 09/11/2026).
[16] 'China's Evolving Counter Intervention Capabilities and Implications for the United States and Indo-Pacific Allies and Partners', US-China Economic and Security Review Commission, 21/03/2024, https://www.uscc.gov/ (checked: 09/11/2026).
[17] Xinhang Zhu et al., 'GEO SAR Refocusing Algorithm of Ship Targets with Complex Motion via CFSFD-Based ISAR Technique', *Remote Sensing*, 17:22 (2025).
[18] 'Instrument: SAR-10', World Meteorological Organisation, 27/11/2023, https://space.oscar.wmo.int/ (checked: 09/11/2026).

supporting its campaign in Ukraine.[19] The comforting idea, present in some analyses over the past few years, that Russian space capabilities are in critical decline does not seem to have accounted fully for the possibility of reverse space technology transfer from the PRC as a way for the Kremlin to compensate for its shortcomings, at least temporarily.

Over the next decade, this pace of space-based ISR capability development will inevitably make the battlefield more 'transparent' to adversaries. This vulnerability – from a British force perspective – is aggravating. On the allied side – eventually to be replicated by the adversary – the standard is set by the US National Reconnaissance Office, which is already integrating electro-optical, SAR, Radio-Frequency (RF), infrared, and Light Detection and Ranging (LIDAR) sensing into a multi-phenomenology remote sensing architecture.[20] Quantum sensors, increasingly discussed, remain far less mature, but even the European Space Agency (ESA) is now researching cold-atom, magnetometry, and Rydberg quantum technologies for future space-based observation.[21] The question of future concealment will therefore be increasingly about how to defeat fused sensors observing different physical, material signatures at the same time, continuously, rather than merely how to avoid the traditional challenge of a passing satellite taking 'pictures' from orbit.

2.2 From seeing to killing: Space and the targeting web

From a kinetic operational standpoint – i.e., strike – the principal purpose of battlefield observation is to convert information into a targeting solution that can be passed to a weapon. Space is now vital to compressing this kill chain. The US has an entire major programme – the Proliferated Warfighter Space Architecture (PWSA) – focused specifically on advancing this kind of capability, with a focus on the missile defence mission. The PWSA is being built as a LEO constellation of different

[19] Bart Hendrickx, 'Stilsat-1: A Russian-owned and Chinese-built satellite watching Ukraine (part 2)', *The Space Review,* 10/11/2025, https://www.thespacereview.com/ (checked: 09/11/2026).
[20] 'NRO Advances Multi-Phenomenology Remote Sensing Solutions', United States National Reconnaissance Office, 10/02/2026, https://www.nro.gov/ (checked: 09/11/2026).
[21] 'Quantum sensing: The next frontier in sensor performance', European Space Agency, 27/06/2025, https://www.esa.int/ (checked: 09/11/2026).

satellite 'layers' of around 600 satellites,[22] with 63 spacecraft already launched under Tranche 1,[23] in addition to earlier demonstrators. Its Custody Layer, for example, is explicitly designed to maintain 24/7, all-weather custody of time-sensitive targets such as hypersonic missiles and to generate high-quality target tracks, while the Transport Layer is intended to provide low-latency, high-capacity optical communications. The buildout of this extensive and highly capable space architecture will continue over the coming years, likely becoming fully operational within a decade, but partly usable long before then. Even on its own, but especially in conjunction with other capabilities under the US' Golden Dome initiative, it will significantly transform the strategic picture around the 'missile threat'.

The UK has indicated its broad intent to keep up with these developments through the Digital Targeting Web (DTW) outlined in the DIP and funded at some £1.8 billion over four years to 2030. The plan is for the DTW to connect sensors, 'deciders', and effectors using Artificial Intelligence (AI) and software. Space does not feature as an explicit component of the web itself; rather, it is treated as a separate sensor domain and an integration challenge.[24] The closely related 'Digital Backbone', intended to support the DTW, is more explicitly tied to current communications and data transport capability planning under the wider British defence space portfolio. The lack of specificity regarding the role of orbital assets in the architecture of the DTW itself is regrettable. Nonetheless, the Ministry of Defence (MOD) is clearly aware of the networking demands of contemporary and future kill chain architectures and of the essential link to the space domain.

The UK's approach is certainly far removed from the pace and scale of the US' method of tackling kill chain/targeting network requirements, but the question is whether it is adequate to Britain's needs. Space is not essential at every point in the kill chain; it is increasingly important, however, in connecting its different components across distance (See: Table 1). Thus, what might not look like an important priority now might become vital in the near future as combat – especially at sea – increasingly involves long-range fires.

[22] H. I. Sutton, 'Major Upgrade Sees Hypersonic Ship-Killer Missiles Aboard China's AIP Submarines', *Naval News*, 16/02/2026, https://www.navalnews.com/ (checked: 09/11/2026).
[23] 'Space Development Agency Successfully Completes Third Launch of Tranche 1 Satellites', Space Development Agency, 16/07/2026, https://www.sda.mil/ (checked: 09/11/2026).
[24] 'The Defence Investment Plan,' Ministry of Defence, 30/06/2026, https://www.gov.uk/ (checked: 09/11/2026).

TABLE 1: SPACE ELEMENTS OF ADVANCED KILL CHAIN/TARGETING ARCHITECTURES

Stage	Reliance on space	Principal qualification
Detection	Partially strong	Air, maritime, and terrestrial sensors can substitute locally
Data relay	Strong at long range	Terrestrial networks remain viable within theatre
Processing/fusion	Low (directly)	Usually terrestrial at Headquarters (HQ)/unit level or edge-based
Target custody	Partially strong	Space particularly valuable over wide areas/mobile targets
Decision	Low (directly)	Indirect dependence through connectivity
Weapon guidance	Variable	Global Navigation Space System (GNSS) PNT useful but not indispensable to all weapons
Strike	Low (directly) today	Predominantly air-, land-, or sea-delivered
Battle Damage Assessment (BDA)	Partially strong	Orbital sensing provides rapid wide-area reassessment

2.3 Space and the autonomous arsenal

The rapid adoption of autonomous systems by leading militaries is another recent development that is reshaping and increasing the role of spacepower, although in a more complex way than is sometimes assumed. The British Army, for example, is already developing ASGARD, a targeting web that combines AI, digital targeting functions, and advanced communications to accelerate the sensor-to-shooter kill chain cycle, and which will be integrated into the DTW.[25] This is being designed to work irrespective of whether the sensor/shooter platforms are crewed or uncrewed/autonomous.

The same broad requirement effectively applies to Collaborative Combat Aircraft (CCA), the New Hybrid Navy, and other distributed autonomous forces: all of these need common timing, mapping, target updates, and Beyond-Line-of-Sight (BLOS) coordination. In turn, these requirements all increase the demand for space-based support, whether at mission planning stage or during the mission itself.

At the same time, however, it should be clearly recognised that autonomy also generally reduces the vulnerability of individual platforms to space denial. The American Defence Advanced Research Projects Agency's (DARPA) Collaborative Operations in Denied Environment (CODE) programme, for example, demonstrated as far back as 2019 that teams of autonomous collaborative Uncrewed Aerial Vehicles (UAVs) would be able to continue missions when all communications and Global Positioning System (GPS) navigation signals became unavailable.[26] In Ukraine, the use of satellite-independent 'fire and forget' one-way drones that use Inertial Navigation Systems (INS) backed by computer vision is now a common occurrence.[27]

Nonetheless, the type and context of the mission matter greatly, and the most operationally valuable employment models involve orchestrating multiple autonomous systems, often in combination with crewed platforms. Autonomy thus cuts both ways: it increases the need

[25] 'Fundamental lethality shift for British Army spearheaded by novel targeting tech "ASGARD"', Ministry of Defence, 20/07/2025, https://www.gov.uk/ (checked: 09/11/2026).
[26] 'In the Sky and on the Ground, Collaboration Vital to DARPA's CODE for Success', Defence Advanced Research Project Agency, 22/03/2019, https://www.darpa.mil/ (checked: 09/11/2026).
[27] 'Un-jammable quantum tech takes flight to boost UK's resilience against hostile actors', Department for Science, Innovation, and Technology, 13/05/2024, https://www.gov.uk/ (checked: 09/11/2026). Britain has tested quantum INS – which replaces GNSS navigation – and aims to deploy this technology on aircraft by 2030.

for space-derived data at Joint Force level while reducing the exposure of individual drones to the loss of space support.

2.4 Missile warning, missile defence, and long-range strike

No other area of contemporary – or future – warfare illustrates the dramatic rise in dependence on space systems more clearly than long-range missile attack and defence. The orbital flank is already exceptionally important on both ends of the 'missile problem', and it will become absolutely essential particularly for intercepting highly advanced missile threats such as hypersonics. On the defence side, the challenge will increase greatly when hypersonic missiles begin to be deployed on submarines – as is now allegedly the case with the PRC's YJ-19 on the Yuan class air-independent propulsion (AIP) submarine,[28] with Russia also pursuing this ambition with the Yasen-M class nuclear-powered attack submarine (SSN).[29]

Tackling these threats requires persistent overhead sensing from space for early warning, maintaining custody of highly manoeuvring weapons, and generating fire-control quality tracks. This extremely demanding technological chain was demonstrated by the US Missile Defence Agency in its Stellar Banshee March 2025 simulated test,[30] which involved a Hypersonic and Ballistic Tracking Space Sensor (HBTSS) demonstrator satellite that is being integrated in the PWSA's Tracking Layer, with an Aegis destroyer conducting the virtual intercept.

As often noted in British defence community debates, long-range missile attack remains arguably the highest conventional direct threat to the British Isles – yet it is also one of the key defence tasks that the UK's defence leadership has inexplicably almost completely failed to provide for. Building on the SDR, the DIP has begun to address this gap, committing new funding for homeland air and missile defence – including new sensors and an Integrated Air, Space, and Missile Defence

[28] H. I. Sutton, 'Major Upgrade Sees Hypersonic Ship-Killer Missiles Aboard China's AIP Submarines', *Naval News*, 16/02/2026, https://www.navalnews.com/ (checked: 09/11/2026).
[29] Tayfun Ozberk, 'Russia Floats Out Yasen-M class Nuclear Submarine Ulyanovsk', *Naval News*, 02/08/2026, https://www.navalnews.com/ (checked: 09/11/2026).
[30] 'MDA and Navy accomplish next step in Hypersonic Missile Defence', United States Missile Defence Agency, 25/03/2025, https://www.mda.mil/ (checked: 09/11/2026).

Operations Centre.[31] However, the DIP only mentions cruise and ballistic missile threats – with sea-based anti-ballistic interceptors as the only stated capability against the latter – seemingly omitting any clear provisions against hypersonics. At some point this requirement will also have to be confronted, together with the inescapable demands it carries for space support, as American programmes such as the PWSA demonstrate.

Lastly, it should be noted that Britain's long-range offensive requirements are also expanding through the new UK-German programme for developing a 2,000+ kilometre (km) DPS missile for service in the 2030s.[32] Again, a robust sovereign space layer for targeting and long-range data links will be essential for the operational employment of this kind of weapon.

Taken together, these developments indicate a significant expansion in the military function of the orbital layer beyond the established missions such as Satellite Communications (SATCOM), PNT, strategic ISR, meteorology, or missile warning. Still, none of this automatically implies that space is now indispensable to warfare in every circumstance, and it is thus worth looking at this in greater detail.

[31] See: 'The Defence Investment Plan,' Ministry of Defence, 30/06/2026, https://www.gov.uk/ (checked: 09/11/2026).
[32] 'UK and Germany meet to advance deep precision strike missile programme to boost national security', Ministry of Defence, 16/03/2026, https://www.gov.uk/ (checked: 09/11/2026).

3.0

THE DEPENDENCY TEST: CAN BRITAIN FIGHT WITHOUT SPACE?

The argument in favour of a stronger British spacepower posture and capability – rooted in the fundamental dependency of modern armed forces on space, now deepened by the acceleration and transformations described in the preceding section – should be tempered by a hard look at its opposite proposition. This test is not only good analytical practice, but it may serve to enhance the credibility of the 'case for space', which so far has failed to move the dial significantly among the UK's defence decision-makers.

What happens if space is taken away? Certainly, complete denial of every military, allied, and commercial space service is an extreme scenario, but it helps to test the core proposition of this Report, which is that space is becoming central to military power. This is less about determining whether aircraft can still fly, ships can still navigate, or artillery can still fire when space is 'gone', and more about how much of the British Armed Forces' operational effectiveness – their range, tempo, precision, and level of integration – is lost, and with what effect, when the orbital flank has collapsed.

3.1 The Ukraine paradox: War without space superiority

Ironically, it is Russia that provides the strongest challenge – at first glance – to any expansive claim in favour of spacepower. The Russian

military has so far sustained a major continental conflict for more than four and a half years, on a considerable scale and with the extensive use of deep strike operations, with a relatively modest contribution from its space capabilities compared to the size of the conflict. Not only has Russia not enjoyed space superiority over Ukraine, but in practical terms, it is inarguable that the extensive space support received from North Atlantic Treaty Organisation (NATO) countries has given Kyiv a major strategic advantage despite Ukraine itself not owning any modern satellites. Ukrainian access to data from high-performance military and commercial space systems has also been paired with allied know-how and technological help in building the crucial space data-processing pipelines that feed into Ukraine's Delta battle management system, and which have helped to compress sensor-to-shooter cycles down to minutes.[33]

Russian military-grade orbital ISR capacity that can significantly support deep strike targeting missions remains relatively sparse with low revisit rates: a combined fleet of roughly 20 imagery spacecraft – mostly optical, and about five SAR[34] – that mixes high-end but old systems such as Persona, and newer but lower-performance satellites such as the Razbeg series. This comparative inferiority has been increasingly forcing the Kremlin to tap into Chinese-provided satellite imagery.[35] For the majority of its day-to-day operational and tactical requirements, Russia uses thousands of tactical UAVs, ELINT and other sensors, and terrestrial communications that have been networked – albeit unevenly – into 'reconnaissance-strike complexes' without requiring dominant orbital capability.[36]

[33] Constant Méheut and Olha Konovalova, 'Ukraine's Most Potent Weapon: The Software Orchestrating Its Drone Army', *The New York Times*, 26/08/2026, https://www.nytimes.com/ (checked: 09/11/2026).
[34] Dmytro Shumlianskyi, 'Russia's Space Reconnaissance Capabilities', *Militarnyi*, 06/04/2026, https://militarnyi.com/ (checked: 09/11/2026).
[35] Michael Connell, 'The Role of Space in Russia's Operations in Ukraine', Centre for Naval Analyses, 15/11/2023, https://www.cna.org/ (checked: 09/11/2026); and Wesley Bailey and Daniel Byman, 'Russia's Cap on Partner Aid: Institutional Rigidity and the Limits of External Support', Centre for Strategic and International Studies, 31/07/2026, https://www.csis.org/ (checked: 09/11/2026).
[36] By 2025, UAVs reportedly accounted for up to 80% of frontline casualties in Ukraine. See: Marc Santora, 'Russia Intensifies Assaults on an Exhausted Ukraine', *The New York Times*, 20/11/2024, https://www.nytimes.com/ (checked: 09/11/2026).

3.2 Maritime warfare: Finding and fighting across long distances

Compared to a continental conflict fought between two neighbouring countries, where terrestrial-based alternatives to satellite services are viable for many tasks, war at sea presents a much harder test-case for military dependence on spacepower. Naval operations are often undertaken at long distances over featureless expanses of water that do not allow for any permanent infrastructure.

A carrier strike group can generate its own local picture through shipborne radar, advanced jets such as the F-35 Lightning II Joint Combat Aircraft, helicopters, and maritime patrol aircraft. It does not become 'blind' if satellite links are lost. However, BLOS communications and command, wide-area reconnaissance, and long-range targeting become much harder, exposing the force to higher risks.

For the Royal Navy, its principal deep strike weapon – the submarine-fired Tomahawk cruise missile, now transitioning to the Block V version[37] – is a case in point. Its navigational architecture combines INS, terrain contour-matching, scene matching, and GPS, with SATCOM for in-flight target updates.[38] Loss of all satellite connectivity would reduce accuracy and also remove some of the flexibility that distinguishes a modern networked weapon from one operating in a pre-programmed mode – but fundamentally, the weapon can still 'work' without space. The extent to which that degraded operational profile impacts its intended military effect will depend on the specifics of each strike mission.

A similar dynamic is set to arise in relation to the future New Hybrid Navy, whose array of distributed uncrewed systems will generate new demands for connectivity if their networked effects are to be exploited to the full in combat conditions. For extended long-range operations, as well as for mission planning, space support would be essential. However, the Royal Navy is also testing local mesh networks specifically designed to allow ships and drones to exchange data without relying on a single hub or traditional satellite links.[39] Again, this shows

[37] 'Submarine Service's Tomahawk missiles receive £265m revamp', Royal Navy, 31/05/2022, https://www.royalnavy.mod.uk/ (checked: 09/11/2026).
[38] 'Tomahawk', United States Naval Air Systems Command, https://www.navair.navy.mil/ (checked: 09/11/2026).
[39] 'Royal Navy uses technology to get operational edge in information warfare', Royal Navy, 01/05/2026, https://www.royalnavy.mod.uk/ (checked: 09/11/2026).

that naval forces can fight through space denial, but at the price of degraded effectiveness and greater vulnerability.

3.3 Air warfare: Combat air as a network rather than an aircraft

A similar situation obtains in the air domain. The Royal Air Force's (RAF) combat aircraft, in particular, carry substantial sensing capabilities of their own and can operate 'without space' in a relatively basic sense, through terrestrial-based tactical data links. However, as with the New Hybrid Navy, the future RAF is increasingly being conceived and planned for as a network rather than a collection of standalone platforms, whether crewed or uncrewed. In this context, the Chief of the Air Staff stated in September 2026 that the RAF's ability to gain and maintain control of the air is 'fundamentally dependent' on freedom of action in and through space.[40]

Some examples of this dependency can be seen with early warning and control aircraft. The E-7 Wedgetail's communications suite includes SATCOM and Link 16 (protected radio), allowing its wide-area radar picture to be integrated with Typhoon, F-35 Lightning II Joint Combat Aircraft, and naval forces at theatre level.[41] In conditions of space denial, the fallback is line-of-sight Link 16 transmissions, and the effective operational kill chain 'bubble' around the E-7 is reduced to perhaps 200-300 nautical miles, which is still substantial. Other platforms can act as relay and extend that range, but the point is that direct theatre level coordination – including reach-back to higher shore-based HQ – is disrupted. To give another example, the RAF's Protector drones are even more dependent on space, because they require a BLOS control link available only via satellite. Again, however, the dependency here is somewhat mitigated by the platform's multi-orbit SATCOM connectivity – including to Medium Earth Orbit (MEO)-based satellites – which increases its resilience.[42]

Precision air-launched weapons also present a mixed picture regarding space integration, particularly as they frequently use GPS.

[40] 'Per Ardua ad Astra: Air Command redesignated to Air and Space Command', Royal Air Force, 01/09/2026, https://www.raf.mod.uk/ (checked: 09/11/2026).
[41] 'Wedgetail AEW1', Royal Air Force, No date, https://www.raf.mod.uk/ (checked: 09/11/2026).
[42] 'GA-ASI, SES, and Hughes Team Up to Demonstrate Next-Gen SATCOM on MQ-9B SkyGuardian', General Atomics Aeronautical Systems, 10/11/2022, https://www.ga-asi.com/ (checked: 09/11/2026).

Newer weapons are increasingly designed with fallback or alternative systems: the SPEAR 3 missile, for example, is also equipped with INS and radar/laser terminal sensing to compensate for navigational drift on the final approach to target.[43]

Thus, air power would also 'survive' in conditions of space denial – but, again, with degraded performance particularly in terms of theatre-wide command, navigation, targeting, and reach. This challenge is likely to become more pressing as CCAs and the future Tempest force will increasingly work as a distributed system-of-systems for combat air operations.

3.4 Land warfare: Recce-strike at scale

As the previous discussion of Russia's full-scale invasion of Ukraine suggests, the land domain offers more substitutes for space-based support as forces usually operate within terrestrial communications range and can increasingly exploit local drones, fibre optics, radio relays – even local mobile phone networks – and organic sensors. Ukraine has demonstrated how effective such (often improvised) architectures can be. However, the operational challenge grows with the engagement range and becomes increasingly problematic with deep precision fires – a capability area that is also now a priority for the British Army.

GPS guidance is described by the British Army as 'integral' to Guided Multiple Launch Rocket Systems (GMLRS), which at present constitutes the bulk of its precision fires arsenal.[44] Russian forces have been able to jam that guidance signal on US-provided GMLRS variants since 2023, with different levels of success, but as the weapons also use INS, this results in decreased accuracy rather than complete strike interdiction. With the introduction of the 500km-range Precision Strike Missile from 2027,[45] the larger difficulty becomes finding the target and generating the fire solution. This task will be tackled by the ASGARD sensor-shooter network system described in the previous section, which is a key part of the British Army's future 'recce-strike' cycle[46] in

[43] 'Wham, bam, goodbye SAM. F-35 new anti-air defence missile successfully tested', Royal Navy, 18/11/2024, https://www.royalnavy.mod.uk/ (checked: 09/11/2026).
[44] 'Guided Multiple Launch Rocket System (GMLRS)', British Army, No date, https://www.army.mod.uk/ (checked: 09/11/2026).
[45] 'Millions invested in new missile to strengthen British Army's capability and NATO deterrence', Ministry of Defence, 07/07/2026, https://www.gov.uk/ (checked: 09/11/2026).
[46] 'New technology unveiled that will increase British Army lethality', British Army, 21/07/2025, https://www.army.mod.uk/ (checked: 09/11/2026).

combination with UAV-based persistent deep surveillance under Project CORVUS[47].

The core theme of this section holds true for the land domain as well: the British Army could continue fighting under severe or complete space denial, but, depending on the operational context, it would be less effective and resilient particularly as its extended airborne sensors – often drones – would themselves be vulnerable to enemy countermeasures. The deeper and more networked the British Army's future recce-strike complex becomes, the more the orbital layer contributes to extracting its full potential – and the more significant the penalty of fighting without space.

3.5 The reality of space dependence

Overall, viewed across the three classic operational domains, the question of the UK's military dependence on space is nuanced: the British Armed Forces *can* fight without space, but the net effect depends very much on the particular circumstances of both the mission and operational context, and of the extent and nature of the disruption to the orbital layer. What the UK's military quite clearly *cannot* do is field the SDR-mandated Integrated Force of the 2030s as presently conceived – global, networked, autonomous, and increasingly oriented towards DPS – without assured access to space.

The dependency is not, therefore, absolute. Rather, British spacepower increasingly determines how much of the next-generation capability designed into the Integrated Force can actually be made available for operations on the battlefields of the future (see: Table 2).

TABLE 2: BRITISH MILITARY SPACE-DEPENDENCY MATRIX

Military function	Representative British capability	Principal space requirement	Non-space substitute	Likely effect of major space denial	Main current source
Maritime Command and Control (C2)/	Carrier Strike Group, New Hybrid Navy	SATCOM, wide-area ISR, PNT	High Frequency/ Very High Frequency (HF/VHF),	Major reduction in information horizon and	Skynet; allied/ commercial services

[47] 'Fleet of spy drones to equip British soldiers and back jobs in South West England and Wales', Ministry of Defence, 25/07/2026, https://www.gov.uk/government/ (checked: 09/11/2026).

distributed operations			line-of-sight data links, local mesh, organic sensors	distributed coordination	
Long-range maritime strike	Astute/ Tomahawk V	GPS, SATCOM updates, external targeting	INS, Terrain Contour Matching (TERCOM)/ Digital Scene Matching Area Correlator (DSMAC), pre-planned targeting	Less flexible strike; weaker dynamic retargeting	US GPS; UK/allied C2
Air command and Intelligence, Surveillance, Target Acquisition, and Reconnaiss-ance (ISTAR)	E-7, P-8, F-35, Typhoon	SATCOM, PNT, offboard ISR/data	Organic sensors, Link 16, terrestrial/ airborne relays	Reduced theatre-wide awareness and coordination	UK/allied/ commercial
Long-endurance Remotely Piloted Aircraft System (RPAS)	Protector	BLOS SATCOM, PNT	Limited alternative links/ autonomy	Potentially severe mission degradation at global range	SATCOM architecture; US GPS
Land precision fires	GMLRS; future Precision Strike Missile (PrSM)	PNT, targeting/ geospatial data	INS, local ISR/UAVs, terrestrial networks	Reduced precision and especially deep-targeting efficiency	US GPS; UK/NATO sensor networks
Homeland missile defence	RAF Fylingdales; future Integrated Air and Missile Defence (IAMD)	Space-based warning/ tracking	Ground/sea/ air radars	Shorter warning and weaker persistent custody of complex threats	UK radar integrated with US/allied architecture

4.0

THE CONTESTED ORBITAL FLANK

The argument presented so far in this Report – that space systems have effectively become central to contemporary warfare, and will grow even more important in the future – carries an inevitable implication: that adversaries will seek to deny space advantage to free and open nations' forces as a matter of increasingly high priority. The space layer will be attacked in any major future conflict. Dependence on space therefore creates its own offence-defence cycle, in that more capable orbital architectures drive the development of more sophisticated counterspace systems – which in turn require greater resilience, protection, and ultimately space control capabilities.

From a British point of view, it must be assumed that in the event of war between space powers – even without initial participation by the UK – the 'orbital flank' will be disrupted either directly or through collateral effects. If Britain does join such a conflict, the question for its future Integrated Force therefore becomes how it will continue fighting against an opponent that will target its space layer.

4.1 Dependence creates a target

This dynamic is already taking place below the threshold of open space warfare. Russia, the PRC, and other space powers possess various types of Electronic Warfare (EW), cyber, direct-ascent Anti-Satellite (ASAT), and directed energy weapons, often in combination with manoeuvrable co-orbital capabilities. Every year, Russian and Chinese spacecraft are being observed performing increasingly sophisticated Rendezvous and

Proximity Operations (RPOs), involving high performance technology. It is a matter of public record that counterspace development and testing – on all sides – are expanding across all these categories, with the important caveat that so far, the focus is mostly on non-kinetic capabilities.[48]

There is a relatively good level of formal recognition of these realities within the British defence community. In 2022, the DSS already acknowledged that adversaries seek to exploit free and open nations' dependence on space and called for resilient orbital, terrestrial, and cyber infrastructure. However, it is not clear to what extent this ostensible awareness of the risks is shared across the British Armed Forces, or how specific it is in relation to the multiple ways that counterspace attacks can unfold.

4.2 How space systems can be attacked

It is useful, therefore, to review briefly the problem of defending the space domain, with reference to the three interconnected attack surfaces presented by space architectures: the ground, link, and orbital segments. The first of these is often overlooked, but arguably the most vulnerable. Satellite operations depend upon terrestrial Telemetry, Tracking, and Command (TTC) stations, gateways, antennas, data-processing facilities, communication networks, the supporting infrastructure such as power supply, and vital launch infrastructure. A proliferated constellation containing hundreds or thousands of spacecraft – designed for resilience against in-space attacks – may still have a comparatively narrow terrestrial 'thin waist' through which data and control must pass, and which can be extremely vulnerable (see: Box 1). Destroying key ground nodes can therefore render even a highly sophisticated space layer virtually useless, or certainly severely impaired, even if the satellites themselves remain intact.

BOX 1: EUROPE'S THIN WAIST

Russia's cyber attack against Viasat's KA-SAT network at the start of its full-scale invasion of Ukraine in 2022 tested precisely this

[48] Victoria Samson and Kathleen Brett (eds.), '2026 Global Counterspace Capabilities Report', Secure World Foundation, 08/04/2026, https://www.swfound.org/ (checked: 09/11/2026).

proposition, as the end goal was to disable tens of thousands of user-level modems without engaging the orbital segment at all.[49]

Another classic 'thin waist' example is in the High North. Aside from the concentration of European space launch infrastructure in this region – Andøya, Esrange, and SaxaVord in Norway, Sweden, and Britain, respectively – there are also key ground stations such as the Svalbard, Tromsø, or Kiruna satellite stations connected by vulnerable Arctic communications infrastructure including undersea cables.[50] These stations are essential orbital data downlink gateways for many military and commercial ISR satellites in polar and sun-synchronous orbits that European nations would rely on in a contingency against Russia, for example.

Attacks against space systems' link segments involve mostly jamming and spoofing against both the uplink and downlink, which have already become widespread around conflict areas.[51] Traditionally, these rely on ground-based EW capabilities, and are most often directed at the user end of the link – such as GNSS and SATCOM jamming as observed in Ukraine. However, some high-powered Russian ground-based EW systems, such as the Tirada-2 or Krasukha-4, are also designed to interfere with LEO satellite transmissions, including space radar sensors.[52] Space-based or co-orbital EW – rather than passive Signals Intelligence (SIGINT) collection – via satellite-borne jammers on RPO-capable spacecraft such as the Russian Luch or Chinese Shijian types[53] – is operationally feasible but has not been publicly demonstrated.

Finally, satellites can be attacked directly, in orbit, with direct-ascent missiles, ground-based lasers, or a variety of effectors

[49] 'KA-SAT Network cyber attack overview', Viasat, 30/03/2022, https://www.viasat.com/ (checked: 09/11/2026).
[50] See: 'Russia stalking ICEYE: A wake-up call for Europe', *Orbital Foresight*, 29/05/2026, https://orbitalforesight.substack.com/ (checked: 09/11/2026).
[51] Victoria Samson and Kathleen Brett (eds.), '2026 Global Counterspace Capabilities Report', Secure World Foundation, 08/04/2026, https://www.swfound.org/ (checked: 09/11/2026).
[52] Bart Hendrickx, 'Russia gears up for electronic warfare in space (part 1)', *The Space Review*, 26/10/2020, https://www.thespacereview.com/ (checked: 09/11/2026).
[53] For the Luch type, see: 'From Cold War interceptors to Ukraine: how Russia came to park spy satellites next to the West's most sensitive tech in orbit', *Meduza*, 23/02/2026, https://meduza.io/ (checked: 09/11/2026). For the Shijian series, see: Todd Harrison et al., 'Space Threat Assessment 2022', Centre for Strategic and International Studies, 04/04/2022, https://www.csis.org/ (checked: 09/11/2026); and Clayton Swope et al., 'Space Threat Assessment 2025', Centre for Strategic and International Studies, https://www.csis.org/ (checked: 09/11/2026).

(kinetic or non-kinetic) carried on co-orbital, RPO-capable spacecraft. Both Russia and the PRC have multiple programmes focused on counterspace capabilities as well as associated technologies, such as on-orbit servicing and refuelling, which are increasing their ability to manoeuvre and conduct RPOs.[54] At the extreme end of the spectrum, American intelligence assesses that Russia is developing a nuclear weapon for potential deployment in space.[55]

It is worth emphasising the wider systemic risk that characterises the space domain more than any other, or even uniquely so. British space architectures need not be specifically targeted – and the UK itself need not be a belligerent – to suffer serious collateral damage during, for example, a US-PRC conflict.[56] Destructive ASAT testing by four countries has already generated 6,904 catalogued debris objects, 2,773 of which remained in orbit in 2026. A (potentially uncontrolled) conflict between major space powers would magnify such externalities.[57] Aside from this, the deep integration between the UK and the US in the space domain means that the loss of certain American space systems – GPS being an obvious example – will have a knock-on effect on British spacepower.

4.3 Fighting through attack: Resilience and reconstitution

The most challenging planning scenario for UK Space Command, however, is that of open space warfare with Britain as a full participant. As previous Council on Geostrategy research has highlighted, a future space war may not be a single-attack 'event', but an attritional confrontation fought over time, in which the mission-focused resilience of space architectures and their wider enterprise support base becomes the deciding factor. The established resilience strategy 'stack' includes disaggregation, distribution, diversification, proliferation, protection, and

[54] Stephen Clark, 'US Space Command: Russia is now operationalising co-orbital ASAT weapons', Ars Technica, 23/04/2026, https://arstechnica.com/ (checked: 09/11/2026).
[55] '2026 Annual Threat Assessment of the US Intelligence Community', Office of the Director of National Intelligence, 14/03/2026, https://archive.dni.gov/ (checked: 09/11/2026).
[56] Incidentally, this is one area of tension in British defence space strategy. Owing to its very close relationship with, and dependence on, the US Space Force, the UK's space leadership considers the PRC an active adversary in space – almost on par with Russia – effectively in the same terms as the US does. This is at odds with the broader outlook of British foreign policy towards the PRC, which is certainly different from and less belligerent than that towards Russia.
[57] Victoria Samson and Kathleen Brent, 'The Counterspace Surge: A Year of Acceleration', Secure World Foundation, 16/04/2026, https://www.swfound.org/ (checked: 09/11/2026).

deception. These can be combined with manoeuvre, alternative terrestrial pathways, allied and commercial support (see: Box 2), and – importantly – reconstitution.[58]

BOX 2: IS EUROPEAN SPACEPOWER A SOLUTION?

The recent acceleration of spacepower development among some individual European NATO allies, particularly in Germany and France, but also via the European Union (EU), might be expected to contribute to overall spacepower capacity and resilience across the alliance, and thus also to enhance the UK's space security in the coming years. However, any optimism in this regard should be tempered by realism on two counts:

1. The politics involved in British-European relations are complex, and may complicate or even prevent adequate cooperation and support in the space domain;

2. There may be practical difficulties in the operational delivery of the major European space capability programmes announced in recent years, from the EU's IRIS^2 to Germany's SatcomBW 4 or SPOCK-1 constellations. Delays and programme reconfigurations are very much to be expected, particularly in light of workforce and industrial base limitations.[59]

A further, and critical, challenge for Europe is its lack of high-end, proven military technology and operational experience – particularly in the area of space control – compared to the standard set within NATO by the US Space Force and US Space Command. In other words, enhancing European spacepower is not just a quantitative matter of building 'more' modern satellites, but a matter of quality across both the technology itself and the entire exploitation and support chain behind it, especially the people.

[58] Gabriel Elefteriu, 'Space resilience in a British context', Council on Geostrategy, 24/06/2026, https://www.geostrategy.org.uk/ (checked: 09/11/2026).
[59] Peter de Selding, 'Germany's Bundeswehr Wants a Rapid Buildup of Its Space Capacity; Germany's Industrial Base is Struggling to Keep Up', Kratos Space, 16/06/2026, https://www.kratosspace.com/ (checked: 09/11/2026).

Even if all announced capabilities do come into service, European allies will remain significantly dependent on the US for persistent high-end ISR, space-based missile warning, Space Domain Awareness (SDA), and launch capacity.[60] Full European space operational independence could not realistically be achieved before 2040. The implication for Britain is that European spacepower may supplement American support, but it cannot replace it within the present military planning horizon.

From the UK's point of view, the future 'resilience mix' for the new orbital capabilities that the MOD envisages for the 2030s beyond Skynet – particularly the Istari ISR constellation,[61] further non-GEO (NGEO) SATCOM (i.e., LEO/MEO), and perhaps new space control satellites – is a question that needs to be baked into these architectures from the planning and development stage – i.e., now – as has been done for Skynet 6. By default, requirements should include an appropriate selection of onboard and offboard active protection for individual satellites, cooperative defences, as well as provision for on-orbit upgrades and mission autonomy.

Beyond this, some approaches, such as extensive proliferation, are likely outside the funding envelope and cannot be pursued. Instead, the core focus at the strategic level should be on preserving the net military effect of British spacepower capabilities by pre-integrating allied and commercial SATCOM and ISR in the MOD's systems, creating alternative ground data pathways, hardening networks, and dispersing control functions.

Given the UK's limited nationally owned satellite fleet, 'orbital reconstitution' – rapid replacement of lost satellites, with a focus on smaller LEO spacecraft[62] – has not been a priority. Other forms of space service reconstitution – such as activating reserve ground stations, alternative signals, or commercial capacity – require attention too. However, as Britain's 'sovereign' satellite fleet grows over the next decade – including an increasing variety of dual-use privately provided satellites

[60] See: Erin Pobjie et al., 'Advancing European Military Capability in Space', International Institute for Strategic Studies, 30/03/2026, https://www.iiss.org/ (checked: 09/11/2026).
[61] 'New satellite deal to boost military operations, jobs and growth', Ministry of Defence, 10/02/2025, https://www.gov.uk/ (checked: 09/11/2026).
[62] For exquisite, high-value assets like SATCOM satellites deployed in GEO, rapid like-for-like replacement is unrealistic.

– orbital reconstitution, in particular, becomes central to Space Command's ability to fight through an attritional space conflict. Thus, its two components – space access (responsive launch from the UK) and the manufacturing base able to produce replacements – quickly begin to acquire much higher strategic significance. This should normally lead to commensurate MOD interest in sovereign space launch, beyond NATO's Starlift programme,[63] complementing the civil programme in this area.

Finally, an essential component of Britain's ability to fight through a space conflict is expected allied support, particularly through NATO. The alliance is beginning to provide the integration layer among the different national military space capabilities. The Alliance Persistent Surveillance from Space (APSS) programme, for example, reached initial operational capability in December 2025, and is building the Aquila virtual constellation with contributions from national and commercial ISR providers. A newer and high-potential initiative, launched in July 2026, is HALO, which sets out to combine sovereign military satellites into a networked constellation for communication, intelligence, and missile tracking. In time, this can become an important part of the UK's own resilience mix, as well as a source of spacepower advantage in future NATO campaigns.

4.4 From protection to space control

Arguably the most important transition required in British defence space strategy at this juncture – when space is becoming so essential to military power just as the space domain itself grows both more complex and more vulnerable – is that from an emphasis on passive defence or protection, including resilience, to a more offensive mindset with a focus on space control. This conceptual shift is now firmly underway, as evidenced in the prominence of space control in recent Space Command leadership messaging,[64] or in the new UK Space Strategy and its explicit embrace of this mission area (see: Box 3).[65]

[63] Begun in 2024, Starlift is intended to combine allied launch sites, commercial launchers, pre-positioned spare satellites, and commercial data purchases to restore capability during a crisis. See: 'NATO's approach to Space', North Atlantic Treaty Organisation, 05/11/2026, https://www.nato.int/ (checked: 09/11/2026).
[64] See: Paul Tedman, Speech: 'Commander of UK Space Command's DSEI 2025 keynote speech on defence in space', Ministry of Defence, 11/09/2025, https://www.gov.uk/ (checked: 09/11/2026).
[65] 'UK Space Strategy', UK Space Agency, 08/09/2026, https://www.gov.uk/ (checked: 09/11/2026).

BOX 3: HM GOVERNMENT'S LANGUAGE ON SPACE CONTROL

2022's UK Space Doctrine defines space control as one of the key space power roles:

> Space control is the use of defensive and offensive capabilities to assure access and freedom of action in space.[66]

Most significantly, the 2026 UK Space Strategy has now set a strategic 'Control of Space Requirement', understood as 'an increasingly important component of national power' and defined as:

> The capability to gain and maintain freedom of action and manoeuvre in, from, and through space; to protect and defend UK and allied space interests; and to deny adversaries the same freedoms.[67]

The direction of travel is therefore increasingly clear, yet the scale of capability alignment required is still underappreciated in the public debate. As orbital manoeuvre and hostile RPOs become routine, the need for Britain to be able to conduct fully fledged orbital warfare – primarily as a deterrence strategy – will become increasingly pressing.

Whether for space control or the other capability areas for the UK's spacepower, the requirements that form the focus of present-day discussions will not remain static. The space operating environment of the mid-2030s is likely to include more persistent multi-phenomenology sensing, optically networked constellations, more autonomous spacecraft, routine RPOs, greater orbital manoeuvrability, and, as already alluded to, improved reconstitution. At the same time, alternative PNT and onboard autonomy may reduce dependence on individual satellite services.

British planning must therefore address not merely the capabilities that exist today, but the operational environment in which systems commissioned during the next period of the UK's defence space strategic planning will actually have to fight.

[66] 'UK Space Power (JDP 0-40)', Ministry of Defence, 01/09/2022, https://www.gov.uk/ (checked: 09/11/2026).
[67] 'UK Space Strategy', UK Space Agency, 08/09/2026, https://www.gov.uk/ (checked: 09/11/2026).

5.0

THE BRITISH SPACEPOWER GAP

From the preceding discussion, it becomes clear that the UK is entering a period of much more demanding requirements for its military spacepower than existed when the DSS was written in 2022. The changes in the operating environment and the global spacepower balance are pushing the discussion well beyond whether defence possesses sufficient SATCOM, imagery, or SDA as discrete capabilities. The focus should now be on meshing spacepower with a developing Integrated Force whose lethality increasingly depends on long-range sensing, rapid targeting – including of very advanced, high-velocity threats – autonomous systems, and precision strike.

5.1 How important is space to British military power?

The principal dilemma in the UK's defence space planning going forward is that of calibrating space capability to the real-world battlefield needs of the British Armed Forces within a ten-year horizon and focusing on the right priorities. In this context, overemphasising the criticality of space across the board risks creating a binary space force development logic, which can be counter-productive. The more realistic baseline for planning should be the recognition that the UK *could* continue military operations under substantial space denial, but that much of the effectiveness and lethality now being built into the Integrated Force for 2030 would be annulled without assured spacepower support. The SDR itself identifies space control, decision advantage, and space support to 'Understand' and

'Strike' as three areas 'without which the Integrated Force will not be able to operate effectively'.[68]

5.2 Capability requirement versus current and planned provision

There is some significant investment now lined up to build up British spacepower,[69] particularly the £9 billion projected defence space spending between 2030 and 2035. Of this, over £6 billion – after discounting the remaining Skynet budget[70] – is not yet allocated to any specific programme lines. This latter sum is the anchor for all of the UK's medium-term military space strategy planning going forward.

In the meantime, the existing British defence space portfolio is moving towards greater integration with dual-use commercial and civil space capabilities. New LEO connectivity, much of it tied to ESA programmes, is now projected to be combined with Skynet into a 'cross-government' SATCOM network of networks architecture with added commercial layers.[71] Defence ISR, originally under the Istari programme – now oddly grouped with space control and a new SDA radar into a single £880 million budget to 2030 – is likewise expected to gain more resilience through better integration with civil and commercial Earth Orbit (EO) data.[72] Other dual-use capabilities, particularly under civilian Active Debris Removal (ADR) and In-orbit Servicing and Manufacturing (ISAM), with relatively low but notable funding, will also help to position defence for operational capability development in this area.

For all the positive messaging around the new UK Space Strategy, however, the concrete programmatic upgrades it contains remain rather marginal from a military spacepower perspective. The gap between the orbital operational requirements – as highlighted in this study – and existing capability programmes remains substantial. In ISR, for example,

[68] 'The Strategic Defence Review 2025 – Making Britain Safer: Secure at home, strong abroad', Ministry of Defence, 02/06/2025, https://www.gov.uk/ (checked: 09/11/2026).
[69] 'UK Space Strategy', UK Space Agency, 08/09/2026, https://www.gov.uk/ (checked: 09/11/2026).
[70] Out of a standing Skynet budget of roughly £5–£6 billion, the DIP and the UK Space Strategy have announced a £2.3 billion spend by 2030, thus seemingly pushing some £3 billion or more of Skynet expenditure into the 2030–2035 timeframe.
[71] 'UK Space Strategy', UK Space Agency, 08/09/2026, https://www.gov.uk/ (checked: 09/11/2026). See also the 'Building Ubiquitous Satellite Communications' section in the Annex to the UK Space Strategy, which details planned funding for Skynet and non-Skynet (i.e., mostly LEO) SATCOM.
[72] 'UK Space Strategy', UK Space Agency, 08/09/2026, https://www.gov.uk/ (checked: 09/11/2026).

even if the systems announced so far – principally, the one Juno optical and up to three Oberon SAR satellites – are delivered within the next couple of years, Britain will still effectively lack any serious sovereign depth in persistent ISR in the early 2030s, and will be completely without missile warning (let alone tracking and targeting), resilient space-based high-precision PNT, orbital reconstitution (i.e., both rapid launch capability and satellite replacement stocks/manufacturing), and high-performance orbital manoeuvre capabilities. In these areas, it remains highly dependent on allies or, in some cases, on commercial providers, often foreign or foreign-controlled.

6.0

RECOMMENDATIONS

The next iteration or phase of the UK's strategic planning for spacepower – whether codified in a separate official document or not – should rest on a different premise from that which underpinned the DSS. That approach, whereby space is seen as a portfolio of enabling services to be supplied to the Joint Force, is now outdated. It should give way to a view of spacepower as a foundational part of the warfighting architecture of the Integrated Force itself, combined with a clear recognition of the sheer scale of the threat and risk that is now becoming a permanent and increasing feature of the space operating environment. The funding available for defence space, particularly from 2030 to 2035, should be prioritised according to the recommendations presented in this section.

6.1 Reorient the defence space strategy more clearly around warfighting

The organising question for the MOD should be how spacepower generates and preserves combat advantage for the Integrated Force in the 2030s, particularly in relation to air and missile defence, autonomous systems operations, and the DTW. This implies the need to revisit the level of space-related spend in the DIP and the balance of capabilities in the current defence space portfolio, which – for historical and commercial reasons – is lopsided, with an overwhelming proportion of the funding going towards GEO SATCOM (i.e., Skynet) and SDA. These remain indispensable, but they should not absorb such a disproportionate share of the available investment; continuing in the long term with such a skewed distribution of funding risks the viability of Britain's defence space posture. Since GEO SATCOM is seen for now as non-discretionary

for defence, and SDA is central to the UK's space operations, it is therefore essential to balance-up the space portfolio around them, with further investment to build up Britain's space-based ISR, missile warning and tracking, counterspace effectors, and other combat-oriented space domain capabilities in an age of high-intensity warfare.

6.2 Define the Integrated Force's space requirements

The lack of a clearly specified 'map' of the British Armed Forces' current and future space dependencies is one of the most glaring gaps in the UK's military planning and defence policy. This should be urgently addressed in order to allow defence to establish measurable requirements for SATCOM, ISR, PNT, missile warning, and targeting across maritime, land, and air missions, including the level of degradation that each force element must withstand if the space layer is attacked and disrupted. Discussing 'resilience' without a defined wartime standard is insufficient; space architectures should be designed against specific attack scenarios and clear requirements for mission-continuity thresholds.

6.3 Accelerate the sovereign capability core

The new UK Space Strategy is, so far, the most forward-leaning space-related document from HM Government in recognising the need for sovereign capability in many areas – even though the language used often errs in favour of the weaker and more ambiguous formulation of 'nationally separable'.[73] Caution and hedging are understandable, as Britain cannot afford complete nationally owned or controlled architectures across every mission. Sovereign investment, therefore, should concentrate where control, assured access, and alliance leverage matter most – i.e., in persistent, diversified ISR and ELINT, protected multi-orbit SATCOM, space control (particularly orbital warfare) systems, and missile warning and tracking. Reducing dependencies will be a long process, but this should remain the persistent goal of the UK's defence space strategy. Allied and commercial capacity should eventually only add depth to this core set of capabilities, rather than being essential to it.

[73] 'UK Space Strategy', UK Space Agency, 08/09/2026, https://www.gov.uk/ (checked: 09/11/2026).

6.4 Build for attritional space warfare conditions

Future British space architectures should be designed to fight through attack. This simple principle is arguably still not the default mode of the UK's spacepower planning, which remains anchored in the patterns associated with peacetime space operations. There is an urgent need to shift the emphasis – and resources – towards diversified orbits and suppliers (particularly large-scale integrators available in the British space industrial base); mandatory resilience packages for key systems (to include onboard and offboard satellite defences, co-operative defences, mission autonomy, and so on); and dispersed ground infrastructure, pre-negotiated commercial substitution, and reconstitution.

6.5 Develop a credible orbital warfare capability

The essential complement to higher resilience across the UK's space domain is the ability to engage and disrupt the enemy's own orbital capability. Passive resilience is rapidly becoming insufficient as adversaries' counterspace arsenals – especially manoeuvrable spacecraft – grow in size and sophistication. However, this is not only a defensive requirement, e.g., for escort and RPO-capable satellites to fend off attacks on British orbital systems. The UK's orbital warfare capabilities will also be required for offensive roles, to hold at risk adversary proliferated communications, ISR, or targeting architectures that would directly enable military operations against British and NATO forces.[74]

6.6 Recast the alliance model

There is no question that Britain will have to continue to rely heavily on allied assistance in the space domain, particularly from Washington, over the foreseeable future. The US will inevitably remain indispensable for warning, tracking, intelligence, and high-end space control support for a long time. However, the UK should evolve its space relationships – including with European countries – from a model that creates

[74] An emerging example of this in the European theatre is Russia's Starlink-type Rassvet constellation, which – despite rollout problems – is likely to become operational in the 2030s. See: Illia Kabachynskyi, 'What Happens When Russia Has Enough RASSVET Satellites to Control Drones Across Europe?', *United24 Media*, 10/09/2026, https://united24media.com/ (checked: 09/11/2026).

uni-directional or lopsided dependency to one focused on sovereign interoperability. The optimal approach to pursue is to develop strategic indispensability by investing in and making unique technology contributions that complement and enhance allied capabilities.

NATO is the primary opportunity in this respect. Its various space initiatives, still in early stages, offer Britain the prospect of connecting some of its space architectures with those of other allies in trusted and resilient networks, such as HALO, for communications, intelligence, and missile tracking.

6.7 Treat the National Space Enterprise as part of warfighting resilience

In strategic terms, the UK's spacepower cannot be separated from the industrial capacity, ground infrastructure, workforce, and all the other domestic space ecosystem elements that collectively form the National Space Enterprise (NSE).[75] A high-capacity and unified NSE, well integrated across the civilian-military axis, able to mobilise and react quickly in emergencies, with well-organised capability programmes supported by a national space technology development roadmap, is indispensable to Britain's ability to sustain and reconstitute its space architectures in wartime. The UK's space strategy should seek a better balance of focus between programmes and outcomes on the one hand – often with delivery timelines spanning several years – and the permanent goal of achieving and maintaining a well-organised, high-performing NSE.

[75] See: Gabriel Elefteriu, 'Better space: Consolidating the UK National Space Enterprise', Council on Geostrategy, 12/11/2024, https://www.geostrategy.org.uk/ (checked: 09/11/2026).

7.0

CONCLUSION

Given the radical transformations taking place across the global space domain, it is becoming apparent that there is no serious path to the Integrated Force envisaged by the SDR that does not also require a much stronger British military spacepower posture. The era of space merely providing 'support to military operations' in an adjunct capacity is now over. Another – very different – chapter is opening up in front of space strategists: one where future military power itself, based on the increasingly networked, long-range, and autonomous forces being built for the 2030s, depends on assured access to the space layer. The alternative here is the potentially catastrophic loss of battlefield effectiveness.

The UK is not yet in a position of acute space domain weakness across the board. It possesses notable sovereign assets, still enjoys privileged access to American capabilities, and has shifted, at least rhetorically, to a harder-edged space posture. However, this all remains relative to the threat and to how other space powers – allied and adversarial alike – develop their own capabilities, including through commercial players.

7.1 Key findings

This Report has argued that the traditional conception of space as a collection of enabling services for forces fighting principally in the terrestrial domains is becoming inadequate. Spacepower is increasingly essential to the way advanced military power is generated, particularly where sensing, communications, targeting, and weapons employment – for both offence and defence – must be connected across great distances and at high speed. This does not mean that the British Armed Forces

become completely incapable of fighting if space support is lost. Rather, the dependency test developed here outlines a more nuanced picture. The UK could continue to conduct military operations under significant space denial, but much of the range, tempo, precision, and integration being designed into the future Integrated Force would be lost with it.

Critically, this growing dependence is developing at the same time as the space domain itself becomes more contested with adversaries building up their counterspace capabilities. British space planning should therefore focus more on the protection, resilience, and control, through offensive and defensive orbital warfare means, of the wider orbital architecture upon which military effects depend. In short, the next phase of the UK's defence space strategy planning should be organised around warfighting requirements.

7.2 Final reflections

Britain's orbital flank is increasingly exposed, just as its importance to the future of the country's defence is rapidly growing. Clearly, the full requirements for securing the UK's space domain advantage outstrip the resources available for orbital capability development. This places a premium on well-informed, realistic, and highly specified planning of future architectures. Above all, a strategic appreciation of the global space power balance and of the multiplying ways in which the space layer can be disrupted is absolutely necessary in order to optimise the allocation of sparse financial resources across different military space programmes.

About the author



Gabriel Elefteriu FRAeS is Senior Research Fellow in Space Power at the Council on Geostrategy. Previously, he was Director of Research and Strategy and a member of the Senior Management Team at Policy Exchange, where he also founded and directed the first dedicated Space Policy Research Unit in the UK. He is an Associate of King's College London; an elected Fellow of the Royal Aeronautical Society; and a founding partner at AstroAnalytica, a space consultancy.

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Address: Alliance House, 12 Caxton Street, London, SW1H 0QS
Phone: 020 3915 5625
Email: info@geostrategy.org.uk

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