

UK–Germany defence cooperation

Bridging the political and military gaps

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Executive summary

Military cooperation between the United Kingdom and Germany has traditionally taken a back seat to the two countries' other key partnerships. Yet new pathways for cooperation in defence become more relevant as both nations see themselves confronted with several challenges: the European security environment has become increasingly hostile since Russia's annexation of Crimea and the instability along Europe's southern borders. At the same time, defence budgets have been under pressure since the 2008 financial crisis and are again threatened by the economic fallout from the Covid-19 pandemic. Meanwhile, the United Kingdom left the European Union at end of January 2020 and is currently negotiating its future relationship with the EU. In this context, German-British defence cooperation is a largely untapped resource that has the potential to make more efficient use of the countries defence resources while contributing to NATO's capabilities as a whole. This study identifies military capability areas in which a closer cooperation between the United Kingdom and Germany is feasible and relevant. It is part of a larger project at King's College London supported by Hanns-Seidel Foundation.

Key findings

- ♦ Contrary to common belief, Germany and the United Kingdom look comparable on paper: they share similar threat perceptions, commit to full-spectrum armed forces, and have similar defence budgets.
- ♦ Both armed forces are similar in general structure and equipment in the land domain, have some differences in their flying equipment, and show very different maritime legacies. However, both differ in their operational tasking, with the UK armed forces focussing more on forced entry operations and rapid and mobile elements while Germany looks towards multinational capability building for national and alliance defence.
- ♦ Because German-British defence cooperation has not been a priority thus far, it has followed convenience and random opportunity rather than strategic planning.
- ♦ Existing cooperation largely builds on equipment commonality, even though operating the same equipment is currently more of a coincidence than the result of deliberate planning between both armed forces. Other cooperation includes the intent to increase interoperability as well as other traditional forms like liaison officers, joint exercises, and cooperation within very specific capabilities.
- ♦ Joint procurement projects remain limited due to diverging industrial and political priorities. Only a few projects have been realised, especially larger ones in the air domain (eg Tornado, A400M, Eurofighter).
- ♦ Adding the perspective of capability gaps in both armed forces as well as the aggregated European NATO/EU picture unlocks so far unexplored cooperation opportunities between both countries across all domains.



3x3 recommendations

Going forward, the most promising avenues for closer cooperation in military capabilities are further exploiting and pursuing equipment commonalities, closing UK-Germany and NATO capability gaps, as well as cooperating on future technologies. Three groups of initiatives stand out: the easy but effective, political symbols and game-changers. For each group, we selected three cooperation opportunities that promise to further UK-Germany cooperation and strengthen European military capabilities.

Easy but effective

These cooperation opportunities are both feasible and militarily relevant, addressing capability shortfalls. As such, these are prime opportunities to be further explored.

1. **Medium-to-long-range precision strike.** UK-Germany cooperation should investigate improvements to their Multiple Launch Rocket System (MLRS) fleets or the joint development and procurement of successor systems to improve their medium-to-long-range strike capabilities.
2. **Air and missile defence cooperation and integration.** Air and missile defence could become another focal point of UK-Germany and allied attention as remaining capabilities in Europe are quite limited. Two avenues are open for addressing the two new dominant airborne threats: small commercial drones in (very) short-range air defence and cruise and ballistic missile on the other end of the spectrum.
3. **German participation in the UK's Complex Weapons Programme.** As European countries traditionally have both too small stocks of precision-guided weapons, and Germany at least faces a significant dependency on the US for many missile types, closer cooperation on this issue can easily benefit European defence capability.

Political symbols

These opportunities for cooperation are more feasible and less militarily relevant. However, they can serve as valuable signals to allies and adversaries.

1. **Institutionalised C-130 experience exchange.** An institutionalised information, best practice and experience exchange through a seconded exchange officer from the RAF to the new joint German-Franco C-130 squadron, creating an effectively trilateral exchange.
2. **Coordinated global port calls/German crew on British vessels.** Coordinating the port calls of German and UK (and potentially other European) maritime assets active across the globe to underline European interests and commitments in other parts of the world. Beyond that, explore the mutual deployment of personnel on vessels. This would enable the participation of German sailors in areas where they usually do not operate, eg in the Asia-Pacific.

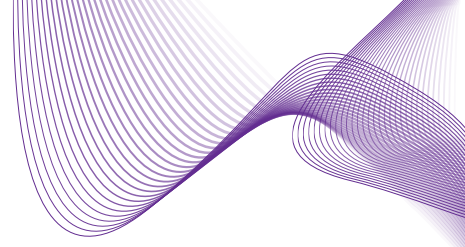
3. **Building a closer European cyber community through cyber challenges.** Germany and the UK should more aggressively promote participation of European forces in the UK's cyber challenges, which are open to other participants. In the future, a regular, joint UK-German cyber challenge specifically for European partners could build on this.

Game-changers

These opportunities for cooperation are less feasible, but would be capability game-changers, addressing capability shortfalls or promoting European integration.

1. **Multi/binational airborne ISR/ELINT/SIGINT/EW fleets.** Addressing the European capability gaps in these areas through further multinationalisation of such assets, akin to NATO's Alliance Ground Surveillance. Germany and the United Kingdom could start this difficult process as these areas also represent their existing or forthcoming capability gaps.
2. **FCAS and Tempest merger.** The political, financial, technological and industrial implications of the respective future combat air systems are so significant that a merger of the two projects would shape European aerospace industry and capabilities for decades to come. Given its political value, Germany, the UK and France should at least continue to explore opportunities for the co-development of technologies, even if these end up in different systems.
3. **Joint MPA fleet (UK/NOR/DE).** Until the future development of the Maritime Airborne Warfare System with France takes off, Germany should explore the lease of P-8 Poseidon, to provide interoperability with Norway and the UK for about 15 years. Additionally, investigate the development or procurement of additional uninhabited systems both in the air and undersea for maritime patrol and anti-submarine warfare.

Introduction



Historically, Germany and the UK have worked for a common European security within NATO and the EU for decades. Yet the relationship between the two countries usually took a back seat to their other key partnerships with the United States and France. UK-Germany cooperation was sometimes referred to as “the silent alliance” as it was generally not much publicised and the two countries tended to work side-by-side rather than together.¹ But in the context of a more complex security environment and ever growing challenges for European armed forces, new avenues for closer cooperation have to be explored.

One of the most challenging tasks facing the armed forces of both countries is adapting military capabilities to the renewed NATO focus on deterrence and defence at a time when they have only just begun to recover from capability reductions and budget cuts after the last financial crisis in 2008. As a result of uncoordinated cuts, European armies lost roughly 35 per cent of their capabilities.² The current economic crisis caused by the Covid-19 pandemic has the potential to deliver a second major financial hit to European defence within the decade.

At the same time, it is important to retain expeditionary capabilities to address emerging instabilities in Europe’s neighbourhood and beyond. Both will require consistent investment in material and personnel and – given the continuously limited availability of funds – a stronger emphasis on efficiency and multinational cooperation.

Though debates about the looming Brexit still dominate the bilateral discussions, it will not influence two fundamental pillars supporting closer cooperation between the countries: first, both countries and societies share the similar values and beliefs. Second, both countries have an inherent interest in a close relationship as the UK sees Germany as a key player in continental Europe, and Germany wants to keep the UK committed to European security.



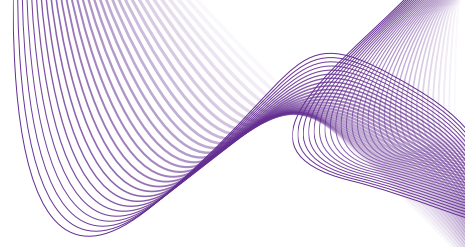
... the UK sees Germany as a key player in continental Europe, and Germany wants to keep the UK committed to European security.”

This intended continuity is reflected in political statements underlining both governments’ intentions for closer cooperation and a host of already ongoing cooperation projects between the armed forces. With Brexit, unprecedented economic disruption caused by Covid-19, deepening EU defence cooperation and a range of security challenges all taking place simultaneously, the UK and Germany require a new way of working together. Closer cooperation and integration between the two countries would also strengthen the weakest link in the Franco-British-German E3-triangle – for the benefit of European security³ and NATO coherence.

As the first in a series of several papers looking at different areas of UK-Germany defence cooperation, the following report identifies military capability areas in which closer cooperation between the two countries would benefit their respective armed forces as well as NATO’s capabilities as a whole. First, we review both countries’ security and defence policies. Second, we conduct a comparison of force profiles and capability gaps as well as future planning. While the bilateral potential stands in the foreground, potential cooperation must also be reconciled with the various capability gaps in European forces, as identified by several studies.⁴ Third, we combine this force analysis with existing and planned cooperation initiatives to identify as yet unexplored cooperation opportunities for Germany and the United Kingdom to

strengthen their armed forces and NATO. Identifying potential for cooperation through the lens of military capabilities can only be a first step, though. Industrial and innovation-related considerations will be added in the two papers completing this series.

Security challenges and defence objectives



National security strategies

Despite the British withdrawal from the European Union on 31 January, 2020, both countries remain committed to a common transatlantic security within the context of NATO. Of course, the United Kingdom and its European neighbours still inhabit the same geopolitical neighbourhood and see themselves confronted with much of the same security challenges. In their official security strategies, the German *Weissbuch zur Sicherheitspolitik und zur Zukunft der Bundeswehr*,⁵ and the British *National Security Strategy and Strategic Defence and Security Review* (SDSR),⁶ Germany and the UK define very similar national interests and identify similar missions for their armed forces. How those strategies are interpreted and prioritised in practice, might differ, of course, but at least theoretically, there is a lot of convergence. Both countries see themselves confronted with a broadening set of security challenges and thus greater demands placed on their militaries, requiring them to be able to carry out a wider and ever more complex range of missions. At the same time, the British armed forces at least have steadily decreased in size in the last decade.



“... today’s German and British armed forces have to be prepared to defend the homeland and their allies.”

When compared to previous security strategies,⁷ the most obvious change in the security environment is the new importance of inter-state conflict and the return of power politics. In 2006 and in 2010 both Germany and the United Kingdom were convinced that they faced “no major state threat [...] and no existential threat to [their] security, freedom and prosperity.”⁸ This perception was echoed in NATO’s strategic concept, which read: “Today, the Euro-Atlantic area is at peace and the threat of a conventional attack against NATO territory is low.”⁹

Today things look vastly different. Classic national and alliance defence has regained importance after the annexation of Crimea by the Russian Federation. While a conventional military conflict was merely a theoretical possibility at the beginning of this century, today’s German and British armed forces have to be prepared to defend the homeland and their allies. Over the last couple of years, Russia has been engaged in a consistent military build-up, threatening European allies at NATO’s Eastern border. At the same time, a return to great power competition does not mean reverting to old answers will provide sufficient protection. New technologies and hybrid warfare techniques below the threshold of conventional war are challenging defence planning within the Alliance. Meanwhile, rapid crisis management capabilities deployed within the context of EU, NATO, or UN missions at Europe’s Southern flank and the Mediterranean remain just as important today.

NATO & EU

While each country defines its respective level of ambition, the reality is that neither Germany nor the United Kingdom are simply responsible for their own security and the protection of their citizens. They are part of collective defence arrangements within NATO and, in Germany’s case, the European Union. As stated in their strategic documents, both countries are committed to their obligations to collective security. The success of these alliances and their collective deterrence and defence posture relies on the right set of capabilities.

NATO’s Strategic Concept defines the major threats that the Alliance is facing.¹⁰ It sees the principal challenges as the proliferation of nuclear weapons in volatile regions,

international terrorism, instability and conflict beyond NATO's borders, cyber and information security, the resilience of NATO members' critical infrastructure, Anti-Access/Area Denial (A2/AD) technology and other technological advancements in defence, threats to the environment and critical resources, as well as health risks and energy security.

Based on this threat assessment, NATO commits to having a full range of capabilities to deter and defend against these threats. NATO defines its three core tasks as follows: 1. Collective defence and deterrence. 2. Crisis management for threats that have the potential of affecting the Alliance. 3. Cooperative security: partnerships with non-NATO members internationally to enhance international security.

Today, Europe's security environment is volatile, with both internal and external changes influencing threat perceptions among allies. Even though the military threat presented by Russia is now fairly established politically, implementing NATO's intended reaction will be neither easy nor cheap for Europeans. More ambitious NATO Defence Planning Process (NDPP) goals are almost certain, and given the limited ability for smaller allies to invest in air and missile defence, the burden might fall on larger states like Germany and the United Kingdom.



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One part of such greater responsibility is leading by example. Beyond national and overall NATO planning, both Germany and the United Kingdom lead multinational capability clusters within NATO – under the auspices of the Framework Nation Concept (FNC).¹¹ The German FNC aims to provide a structured approach to joint capability development and the creation of larger formations.¹² The 24 capability clusters in which the FNC pursues joint development are very diverse, from ballistic missile defence to basic helicopter training.¹³ Their aim is to address capability shortfalls identified by the NDPP.¹⁴ By now, 21 countries (including Germany) are part of this initiative, essentially all EU countries east of Germany plus the BENELUX countries as well as Norway and Switzerland.¹⁵ Lastly, “[...] the FNC is clearly related to NATO's collective defence in Europe as opposed to crisis management operations.”¹⁶

The British FNC, the “Joint Expeditionary Force” (JEF), was initiated in 2018 between the UK and the Nordic countries, the three Baltic republics, Denmark and the Netherlands. As its name suggests, its aim is the development of “a high-readiness contingency force under British control”.¹⁷ Contrary to the German FNC, the JEF is more selective in its membership, very much focussing on like-mindedness of its members and existing military ties. Its composition, regardless of the mission at hand, essentially includes a British lead element, with partner nations providing some force elements, and, at times, a main interventional capability, also with partner nations' contributions.¹⁸ The JEF is more focused on utilising existing forces, while the FNC includes capability building.

Lastly, ongoing EU efforts in defence will also have an impact on German force planning. Even though both NATO and the EU stress the coordination of their efforts, congruence is not guaranteed. The Coordinated Annual Review on Defence (CARD), the Permanent Structured Cooperation (PESCO) and the European Defence Fund (EDF), as well as the Strategic Compass process, which has now



... retaining full spectrum forces is a constant struggle, especially as defence budgets may face come under further pressures with the unfolding economic crisis.”

begun, will all influence European force planning, thus also influencing German planning and what the UK can expect of its continental allies. Moreover, it remains to be seen how third-party participation in especially PESCO and the EDF is going to be solved.¹⁹ This will inevitably influence the possibilities for future cooperation and with the UK.

Armed forces

Both Germany and the United Kingdom largely share similar threat perceptions, consider their armed forces to be full-spectrum forces and feature similar defence spending. Nevertheless, retaining full spectrum forces is a constant struggle, especially as defence budgets may face come under further pressures with the unfolding economic crisis. One way to alleviate this stress is through intensified cooperation between the two countries and more partners.²⁰ Up until the signing of the Joint Vision Statement in 2018 by their Ministers of Defence, cooperation between Germany and the United Kingdom was largely limited to joint armament programs, especially in the air domain (eg Tornado, A400M, Eurofighter), as well as traditional forms of cooperation, including secondment of liaison officers, joint exercises and cooperation within very specific capabilities such as wide wet gap crossing.²¹ Now, however, various potential avenues are explored across the domain and capability spectrum.

Force profile

Budget

In 2019, the United Kingdom (US\$60,76bn) and Germany (US\$54,75bn) were the two largest European NATO spenders (in current US\$).²² However, it was only in 2019 that Germany overtook France as the second largest spender, demonstrating one effect of the steady defence budget increases in Germany over the past years, totalling a nearly 25 per cent increase between 2014 and 2019.²³ Even though the UK increased its spending by only about six per cent over the same time span, it still spends about 10 per cent more than Germany on its defence.

The United Kingdom is adamant about retaining a military spending level of two per cent of its gross domestic product (GDP) to fulfil NATO's spending pledge.²⁴ Germany, on the other hand, has only just begun increasing the share of its defence spending as measured against its GDP. The goal of the current government is to reach 1.5 per cent by 2024 and two per cent by 2030.²⁵ At least for 2020, both countries will likely increase their spending as a percentage of GDP, yet primarily due to GDP contraction. Equally important is the question of how the money is spent. Germany constantly missed out on its NATO²⁶ (and EU²⁷) target of spending 20 per cent of its expenditures on equipment (including R&D), while the United Kingdom continuously fulfilled this criterion throughout 2013-2019.²⁸ Still, both countries equally fear underfinancing their planned procurements with current spending plans – even before the full impact of Covid-19 is known.²⁹

Personnel

The overall headcount of active military personnel for Germany is considerably higher – nearly 20 per cent – than that of the British armed forces (181,400 to

148,450 in 2019). However, the United Kingdom retains a significantly larger reserve force, which historically accompanies active forces in major operations.³⁰ Including reserves in the headcount reverses the proportion, with a total force of 210,600 personnel in Germany to 228,250 in the United Kingdom. Yet this might change, as some observers expect further personnel cuts of up to 20,000 in the UK's armed forces with the upcoming Integrated Review.³¹

Structurally, the Bundeswehr seems to have embraced jointness in its services to a larger degree than the British Armed Forces, at least organisationally. This is reflected in the foundation of the Joint support services (Organisationsbereiche) on the level of the traditional services of army, navy and air force (Teilstreitkräfte).³² These joint support services incorporate all Bundeswehr elements in the areas of cyber, medical and combat service support. The UK, on the other hand, largely retains these elements in their traditional services.³³ In contrast, Germany lacks an overarching joint military command like the UK Strategic Command, aiming to address multi-domain challenges.³⁴

Equipment and capabilities

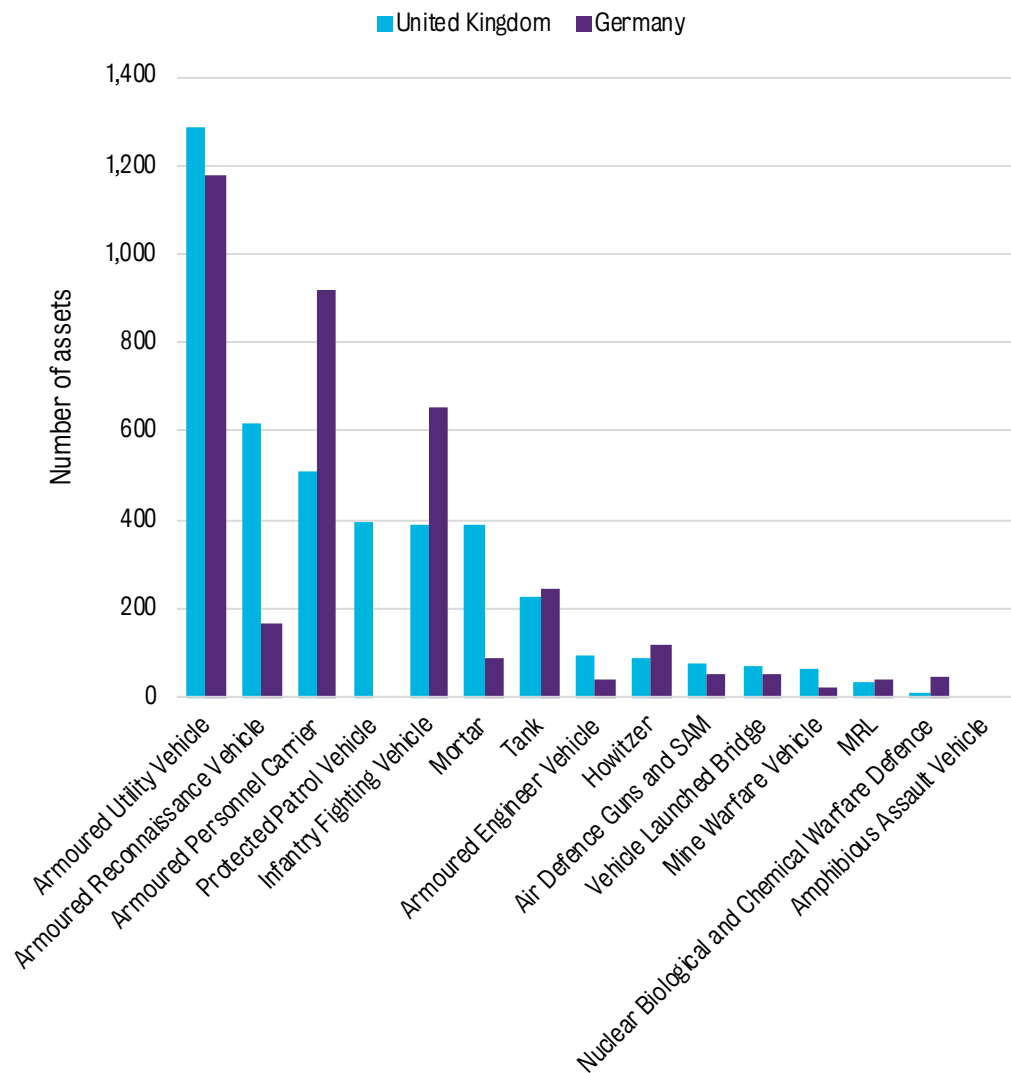
Both Germany and the United Kingdom claim to retain very capable forces able to act in a variety of scenarios. For the UK, the SDSR2015 states: “We will strengthen our Armed Forces and our security and intelligence agencies so that they remain world-leading. They project our power globally, and will fight and work alongside our close allies, including the US and France, to deter or defeat our adversaries”.³⁵ For Germany, the Bundeswehr Concept states: “The Bundeswehr provides capabilities for the entire range of tasks with operational military and civil forces and resources.”³⁶

Comparing the German and British armed forces reveals a mixed picture of similarities and enduring differences determined by historical and current tasks. The following comparison looks at the main equipment categories and quantities in both countries in 2019.

In the land domain, both armed forces feature equipment across nearly all categories, as Figure 1 shows. In most categories, they even field in similar quantities, eg in armoured utility vehicles, tanks, howitzers, multiple rocket launchers and some engineering vehicles. Moreover, even categories that show significant differences can often be traced back to different designation of systems, rather than fundamentally different vehicles or specifications. British “Mastiff” protected patrol vehicles, for example, are even heavier than some of the German Fuchs APCs used for similar patrol tasks during deployments.

FIGURE 1: GERMAN & BRITISH LAND DOMAIN EQUIPMENT IN ABSOLUTE NUMBERS, 2019

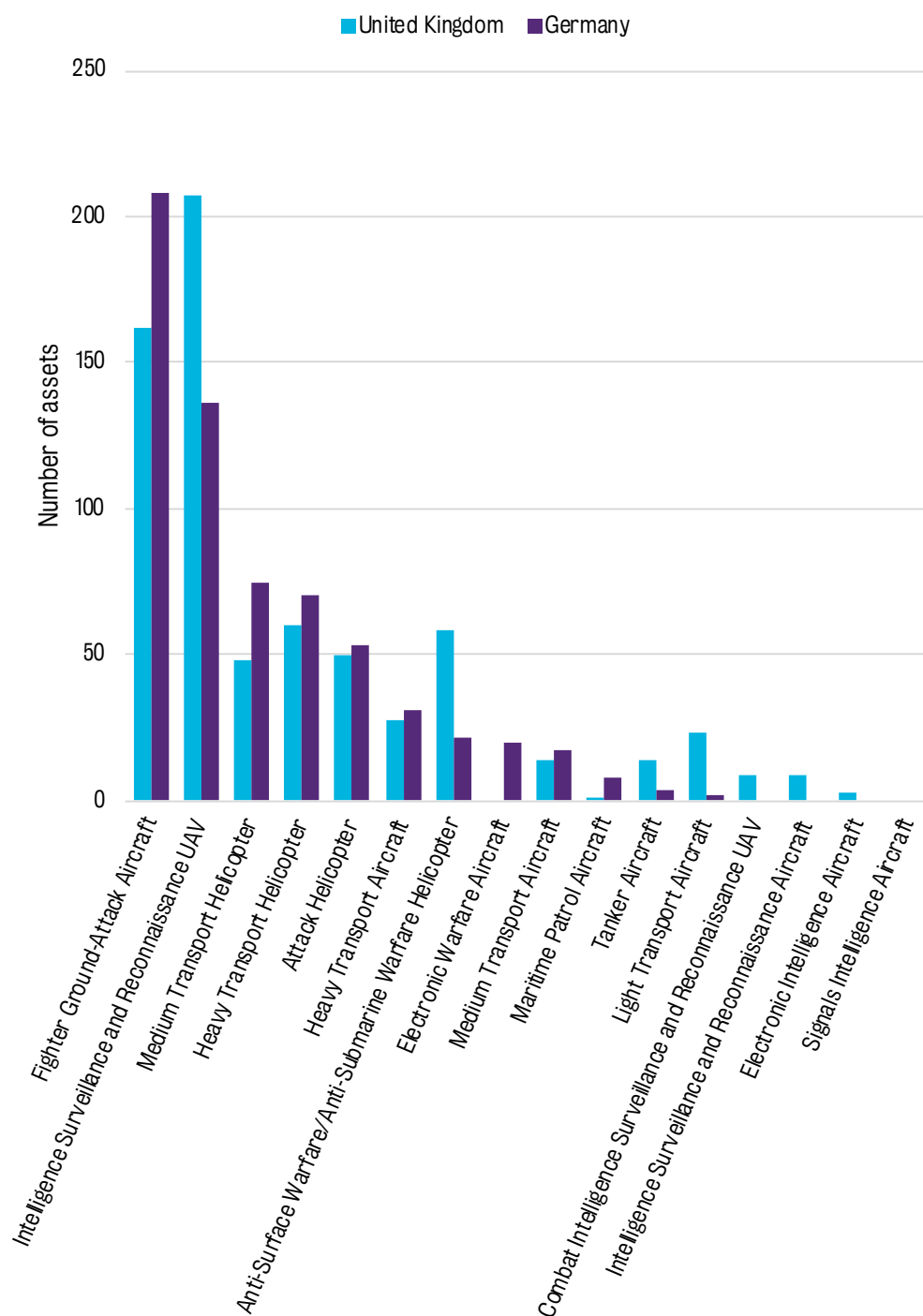
SOURCE: IISS, 2020



Similarly, Figure 2 shows that the air forces of both countries are similar in their composition – for example, in fighter-ground attack aircraft, heavy transport helicopters, attack helicopters and heavy as well as medium transport aircraft. Major and important deviations can be seen in two areas: first, Germany holds less surface warfare/anti-submarine warfare helicopter, which is not surprising given the larger size of the Royal Navy and its surface combatants. Second, both air forces field different support aircraft: while the Royal Air Force is strong in tanker and ISR aircraft, Germany has more active maritime patrol and electronic warfare aircraft. However, both aircraft face the end of their service life in 2025/2030 – the P-3C Orion and Tornado ECR, respectively.³⁷

FIGURE 2: GERMAN & BRITISH AIR DOMAIN EQUIPMENT IN ABSOLUTE NUMBERS, 2019

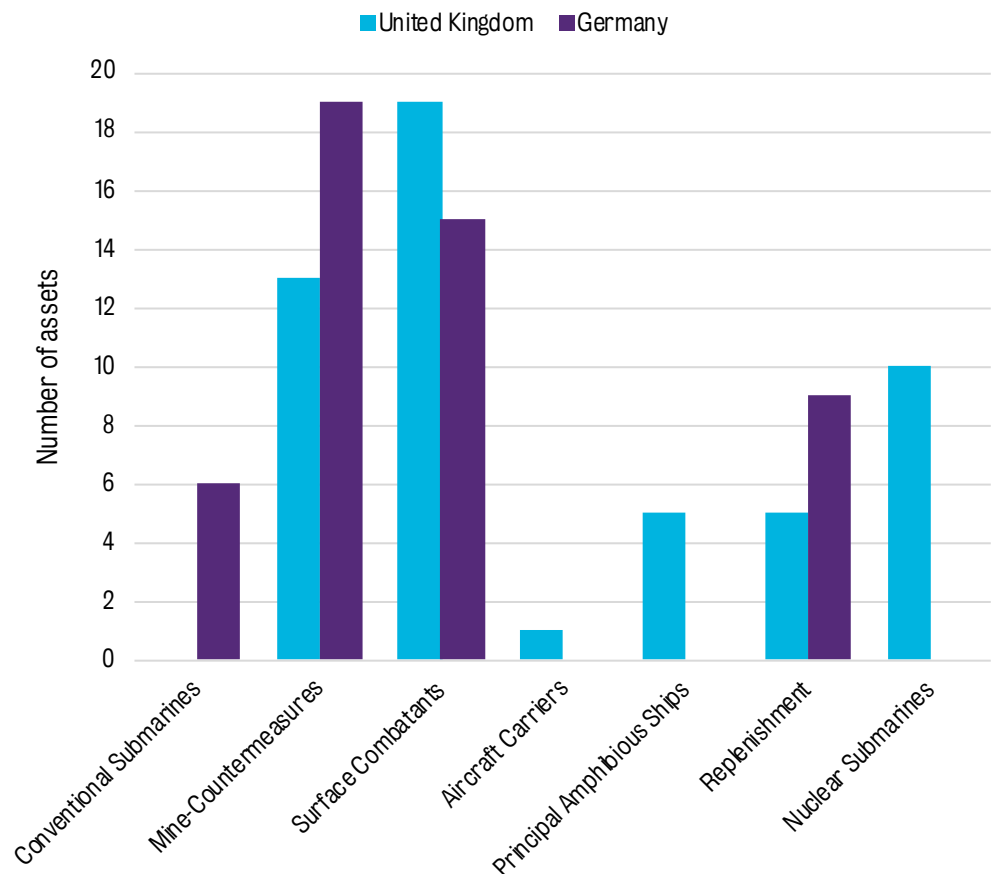
SOURCE: IISS, 2020



Compared to their armies and air forces, the German and British navies differ more in their character, more clearly showing different operational taskings, as Figure 3 displays. The British focus on expeditionary power projection and the nuclear deterrent, as stated in the SDSR, shows clearly in aircraft carrier(s), principal amphibious ships, and nuclear submarines. At the same time, Germany's longstanding focus on activities in and around the Baltic Sea and parts of the North Sea still show a concentration on mine warfare capabilities and the conventional submarine fleet. Moreover, even among the principal surface combatants, German vessels are generally smaller in displacement and crew requirements (eg the corvette K-130). Both navies, however, field several vessels for replenishment tasks.

FIGURE 3: GERMAN & BRITISH MARITIME DOMAIN EQUIPMENT IN ABSOLUTE NUMBERS

SOURCE: IISS, 2020



Mind the capability gap

There are two perspectives on the force profiles of Germany and the United Kingdom: first, both armed forces show areas where they do not fulfil their aim of representing world-class militaries able to perform nearly the whole range of military operations. These areas could provide natural opportunities for both countries to jointly close national capability gaps and strengthen. Second, the German and British forces can be compared with their main allies, especially other Europeans, for which their contributions in both deterrence and defence as well as expeditionary scenarios would be most important. Strengths and weaknesses in relation to other Europeans

then enable a better evaluation of the value of German-British capabilities for the alliance and thus beyond national or bilateral considerations.

German-British weaknesses and gaps

Benchmarking armed forces is inherently difficult, especially based only on information from open sources. However, national capability weaknesses or gaps can be identified if either Germany or the United Kingdom have openly admitted these shortfalls or if qualified observers question the sufficiency of existing capabilities or hint at gaps. Table 1 combines these approaches to arrive at national-level capability weaknesses and gaps of the German and British armed forces across domains.

TABLE 1: CAPABILITY WEAKNESSES AND GAPS IN GERMAN AND BRITISH FORCE PROFILES

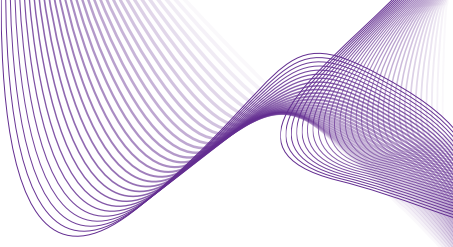
SOURCE: AUTHORS' COMPILATION

DOMAIN	UNITED KINGDOM	GERMANY
Land	<ul style="list-style-type: none"> A lack of indirect fire support equipment/capabilities for high-intensity conventional scenarios³⁸ A lack of medium-to-long-range air defence. Even the timely introduction of "Sky Sabre"³⁹ will not change that significantly 	<ul style="list-style-type: none"> Given a similar amount of indirect fire hardware as the UK (howitzers, multiple rocket launchers), but a larger aspiration in deploying armoured forces, especially in the future, Germany also likely lacks sufficient indirect fire capabilities for high-intensity warfare Insufficient (very) short-range air defence capabilities⁴⁰ Limited sustainability of medium-to-long-range air defence capabilities due to too few personnel and material⁴¹
Air	<ul style="list-style-type: none"> Currently very limited Maritime Patrol Aircraft (MPA) quantities as P-8 Poseidon are just being delivered⁴² No dedicated signal intelligence (SIGINT) aircraft, most likely taken over by limited ELINT assets 	<ul style="list-style-type: none"> MPAs will be retired 2025 at latest, requiring a market-available solution to prevent new capability gap⁴³ So far, the German procurement programme for a new airborne SIGINT capability was not successful in closing this capability gap, now aiming for ~2025⁴⁴ As the German "Tornados" combat aircraft come close to the end of their service life, German airborne electronic warfare, IMINT ISR and air-to-ground capabilities would become new capability gaps⁴⁵
Maritime	<ul style="list-style-type: none"> Limited ability to comprise continuous carrier strike group⁴⁶ 	<ul style="list-style-type: none"> Virtually no ability to land amphibious infantry⁴⁷ Very limited power projection capabilities with no aircraft carrier or principal amphibious ship
Space	<ul style="list-style-type: none"> Lack of ISR satellites Lack of sovereign access to global navigation satellite system 	<ul style="list-style-type: none"> Limited ISR capabilities (only radar)

Aggregated European capability weaknesses and gaps

Instead of just looking at national weaknesses, another way to identify both insufficient and valuable capabilities in an alliance context is to look at an aggregated picture of European or NATO capabilities. Both EU and NATO identified shortfalls in the past, reflected for example in EDA's Strategic Context Cases.⁴⁸ EDA identified a number of development priorities, including:

1. Military mobility (including strategic air transport), enhanced logistics and medical support (including air medical evacuation)

- 
2. Air superiority capabilities including air combat capabilities, ISR platforms, A2/AD capabilities, air-to-air refuelling (AAR), ballistic missile defence (BMD)
 3. Underwater control, including mine warfare, anti-submarine warfare, and harbour protection
 4. Information superiority, including ISR capabilities.

These are largely consistent with capability gaps and priorities identified by NATO. In a paper written to mark NATO's 70-year anniversary, Wayne A. Schroeder identified five important capability gaps that still represent the main shortfalls that NATO is seeking to address.⁴⁹

- ♦ General Strategic Lift
- ♦ Intelligence, Surveillance, Reconnaissance, (ISR)
- ♦ Deployable Command and Control (including C2 networks)
- ♦ Air-to-Air Refuelling, (AAR)
- ♦ Air and Missile Defence (AMD).

If the aggregated European military capabilities are insufficient to execute particular missions, it is likely that national capabilities are also insufficient. National capabilities – or their absence – can even make the difference as to whether joint missions are possible or not, especially when larger military powers that are rather difficult to replace, such as Germany or the United Kingdom, are involved. In such scenarios, even excluding a high-intensity peer-to-peer conflict scenario, European armed forces faced shortfalls in a variety of capabilities necessary to fulfil the EU's level of ambition.⁵⁰ In most scenarios involving substantial land forces, support forces ranging from engineers to military police were in short supply. In the maritime and air domains, the shortfalls were mostly with technologically sophisticated and expensive capabilities such as airborne ISR, principal amphibious ships or heavy airborne transport assets.⁵¹

TABLE 2: CAPABILITIES WEAKNESSES AND GAPS IN EUROPEAN FORCE PROFILES

SOURCE: IF NOT STATED OTHERWISE, IISS/DGAP, 2018

WEAKNESS/GAP	WEAKNESS
Land	<ul style="list-style-type: none"> • Information operations • Medical troops • Explosive ordnance disposal (EOD) • Military police • Integrated air and missile defence (AMD) (short- to long-range)⁵² • Medium-to-long-range precision strike⁵³ • Dry and especially wet cap crossing capabilities⁵⁴
Maritime	<ul style="list-style-type: none"> • Aircraft carriers • Principal amphibious ships • Nuclear submarines
Air	<ul style="list-style-type: none"> • Heavy transport helicopters • Anti-submarine warfare⁵⁵/maritime patrol aircraft • Tanker aircraft/air-to-air refuelling • Electronic intelligence (ELINT)/signal intelligence (SIGINT) aircraft • ISR aircraft • Heavy transport aircraft
Space	<ul style="list-style-type: none"> • Satellite communication scarcity⁵⁶

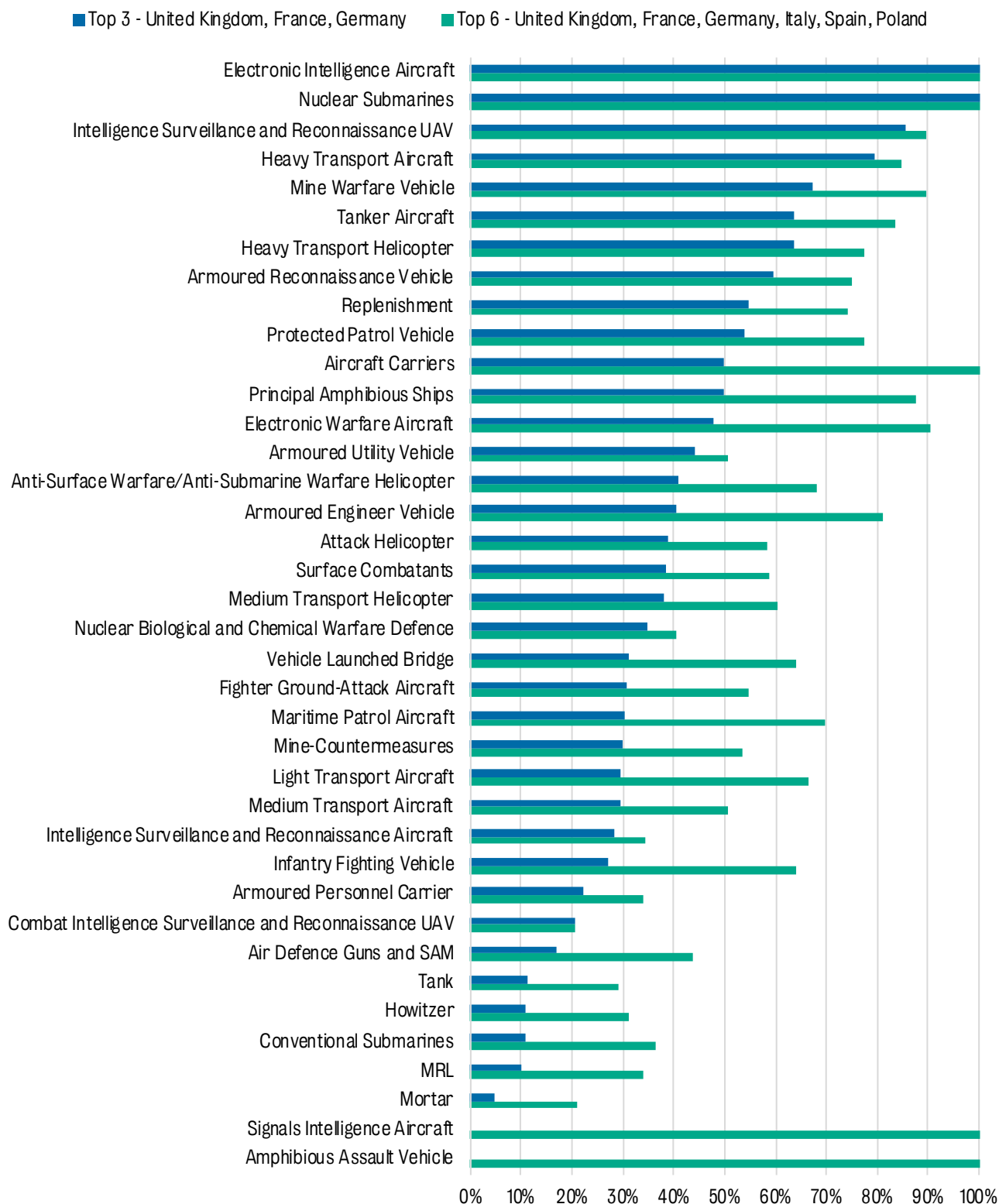
“... larger armed forces have a heightened responsibility to retain technologically sophisticated and expensive capabilities in order to maintain an overall balanced structure [among European armed forces].”

As technologically sophisticated and expensive capabilities are traditionally supplied by larger and economically stronger states, it is no wonder that Europe, comprised mostly of small to mid-sized militaries, lacks such capabilities.⁵⁷ Figure 4 shows how some valuable force enabler capabilities are heavily concentrated in the largest European armed forces. Capability gaps in national force profiles are thus less likely to be compensated by other allies. Consequently, larger armed forces have a heightened responsibility to retain such capabilities in order to maintain an overall balanced structure.

At the same time, the capital intensity of such capabilities makes them prime candidates for closer multinational cooperation. NATO's own success with its Airborne Early Warning and Control System (AWACS)⁵⁸ and Alliance Ground Surveillance (AGS)⁵⁹ fleets are exceptions, though. Mostly, challenges with information sharing in the case of ISR assets, as well as technological concerns, are significant obstacles to any possible multinationalisation of such assets. Consequently, capital-intensive cooperative projects that are comparatively unsophisticated in technological terms, such as the multinational tanker aircraft fleet (Multinational MRTT Fleet [MMF])⁶⁰ or the Strategic Airlift Capability (SAC),⁶¹ have a better chance of being realised.

FIGURE 4: CONCENTRATION OF SELECTED LAND, AIR AND MARITIME ASSETS IN LARGER EUROPEAN ARMED FORCES, 2019

SOURCE: IISS 2020



Development & procurement

Multinational armament and other forms of joint procurement programmes are one of the most visible forms of military cooperation in the capabilities sector.⁶² As capability gaps open due to the obsolescence of old equipment or an emerging threat, bi- or multinational technical studies, joint development or procurements are common reactions among European allies.

An analysis of selected equipment programmes by both the UK and Germany reveals that only very few procurements in both countries overlap, due to diverging industrial and political priorities. These are mostly capital-intensive post-Cold War programmes from the 1990s, such as Eurofighter and A400M, that are coming to an end (at least in terms of deliveries) soon. The UK's decision to procure "Boxer" armoured personnel carriers (APCs) is one of the few examples in a non-air domain.⁶³ Equipment commonality – that is, cases where both armed forces use the same or very similar equipment – is more typical, but unplanned.



... cooperation on R&D for future capabilities might be fruitful, as these often are pursued nationally, which makes bilateral cooperation easier.”

All this results in quite limited equipment-related cooperation opportunities on a system level, such as the river-crossing amphibious vehicle M3 successor. Table 3 shows that even among future capability developments, only limited cooperation opportunities arise as industrial considerations and path dependencies of early project decisions weigh heavy when it comes to merging or introducing new partners. Beyond the joint development or procurement of equipment on a system level, joint procurement of spare parts or maintenance and training contracts would also constitute progress. These opportunities are limited to the equipment that is operational in both armed forces (and in not too specific national configurations), though. Lastly, cooperation on R&D for future capabilities might be fruitful, as these often are pursued nationally, which makes bilateral cooperation easier.

TABLE 3: SELECTED COMMON OR SIMILAR EQUIPMENT PROGRAMMES IN GERMANY AND THE UNITED KINGDOM, SORTED BY STATUS

SOURCE: IISS 2020/BUN-DESVERTEIDIGUNGSMINISTERIUM 2020/HM GOVERNMENT 2020/AUTHORS' COLLECTION

DOMAIN	STATUS	PROGRAM
Land	Operational	<ul style="list-style-type: none"> • Medium-to-long-range strike: MLRS (Germany & United Kingdom) • All-terrain vehicle: BvS-10 (Germany & United Kingdom) • River-crossing equipment: M3 (Germany & United Kingdom) • APC: Boxer (Germany)
	Procurement	<ul style="list-style-type: none"> • APC: Boxer (United Kingdom) • Short-to-medium range air defence: Sky Sabre (United Kingdom) • Medium-to-long-range air defence: TLVS (Germany)
	Development	<ul style="list-style-type: none"> • Short air defence: Germany in cooperation with Netherlands • Tank and artillery: Main Ground Combat System (Germany, with France) • Artillery: Close Support Fires Programme (United Kingdom)
Air	Operational	<ul style="list-style-type: none"> • Heavy transport aircraft: A400M (Germany & United Kingdom) • Fighter/ground attack aircraft: Eurofighter (Germany & United Kingdom) • Medium transport aircraft: C-130 (Germany & United Kingdom) • Tanker/transport aircraft: MRTT (Germany & United Kingdom)
	Procurement	<ul style="list-style-type: none"> • SIGINT aircraft: Pegasus (Germany) • Tanker/transport aircraft: MRTT (Germany with MMF partners) • Heavy transport helicopter: STH (Germany) • Maritime patrol aircraft: P-8 Poseidon (United Kingdom) • Airborne early warning & command aircraft: E-7 (United Kingdom) • Uninhabited Aerial Vehicles: Protector RG Mk1 (United Kingdom)
	Development	<ul style="list-style-type: none"> • Sixth-generation combat aircraft: FCAS (Germany, with France, Spain); Tempest (United Kingdom) • Maritime patrol aircraft: Maritime Airborne Warfare System (Germany, with France) • Fighter/ground attack aircraft upgrade: Eurofighter (Germany, EASA Radar) • ISR aircraft upgrade: Shadow R Mk1+/2 (United Kingdom) • Uninhabited aerial vehicles: EUROMALE (Germany, with EU)
Maritime	Operational	<ul style="list-style-type: none"> • No commonalities
	Procurement	<ul style="list-style-type: none"> • No commonalities
	Development	<ul style="list-style-type: none"> • New replenishment tanker (Germany) • Fleet solid support ship (United Kingdom) • Air defence surface combatant: F127 (Germany), Type 4x (United Kingdom)
Space	Operational	<ul style="list-style-type: none"> • No commonalities
	Procurement	<ul style="list-style-type: none"> • ISR satellites (radar): SARah (Germany) • Space surveillance system (Germany & United Kingdom)
	Development	<ul style="list-style-type: none"> • ISR Satellites (United Kingdom support for private Vivid-I constellation) • Space-based early warning and target designation system for air defence (Germany) • Future satellite-based communication (SATCOM) (Germany & United Kingdom)

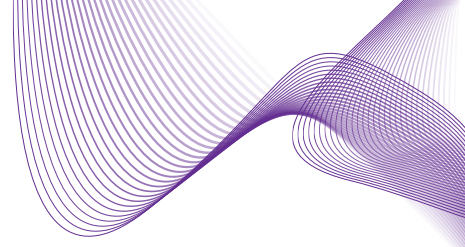
Procurement patterns and cooperation

Underlying this limited overlap of both active and future armament programmes are diverging political choices: most procurements in the United Kingdom that go beyond older European projects are very much focussed on domestic procurements (maritime, some air, some land), transatlantic procurements (air) or imports (land). Moreover, the United Kingdom seems to prefer collaboration with the US instead of European partners in selected cases.⁶⁴

Germany's preference, on the other hand, is domestic procurements in the land and maritime domains, while preferring European collaboration for the air domain. Imports, especially from the US, are limited to areas where either traditional supply relations prevail (air defence, missiles in all domains) or market-available solutions are favoured/the European industry is unable to deliver (heavy transport helicopters, air). Unfortunately, this constitutes an unfavourable setup for armament cooperation, especially given the long-lasting path dependencies of such political strategies.

Opportunities for cooperation

– now and in the future



In 2016, the United Kingdom and Germany signed a Joint Vision Statement and committed to closer military cooperation. This commitment to a closer bilateral relationship was already laid out in the national defence strategies of both countries. Beyond the declarative symbols, the two countries wanted to foster cooperation in areas such as governance, operations, intelligence, different military domains, capabilities, and industry. However, cooperation between the United Kingdom and Germany has been driven by convenience and accidental alignment rather than strategic consideration thus far. Instead, a look at capability gaps in both armed forces as well as the aggregated European NATO/EU capabilities reveals more strategic cooperation opportunities across all domains that have so far been unexplored. For a more extensive overview of ongoing, planned and potential future cooperation, please refer to Table 4 in the annex.

Most existing and currently planned cooperation initiatives are shaped by two factors:

- 1. Commonality in equipment** – both operational and planned for procurement. Consequently, these initiatives are concentrated in the two domains with the largest commonalities: land and air. In the land domain, both armies currently explore cooperation due to the UK's decision to procure Boxer APCs as well as the intention of both countries (and additional partners) to replace their BvS-10 all-terrain vehicles. A potential British participation in the Franco-German MGCS project is another topic of discussion. Lastly, the wide wet gap crossing capability, signified by the joint engineer unit in Minden, Germany, and the equipment commonality in the M3 amphibious rig, is an area of intense cooperation, as might be a potential successor. In the air domain, the Eurofighter and the A400M aircraft are common denominators. Future potential lies in Germany's decision about its new heavy transport helicopter, as the UK flies the CH-47, as well as in the politically and industrially important respective future combat aircraft programmes FCAS and Tempest.
- 2. Cooperation potential in “new domains”.** The second factor shaping cooperation beyond equipment is the “novelty” of capabilities in the respective armed forces and cooperation between them. In amphibious, medical and cyber capabilities, information exchanges and initiatives aiming to increase interoperability so far take precedence over more traditional equipment-related cooperation.

While these are notable efforts, looking at capability gaps and traditional strengths of the German and British armed forces and European NATO members uncovers useful opportunities to strengthen the force profiles of the Alliance. In the land domain, air and missile defence, medium-to-long-range precision strike, rapid reaction forces and military mobility stand out as capability gaps. Closer UK-Germany cooperation could make good use of existing forces and capabilities here. Investment in these areas would also be more efficient if conducted jointly. In the air domain, airborne enablers like electronic warfare, maritime patrol and ISR aircraft (including ELINT/SIGINT) are still rare assets in Europe. Aligning German and British plans for the procurement of future aircraft could benefit both countries, as well as NATO. To a certain degree, the same goes for space assets, such as where space-based elements of the air and missile defence capability gap could offer cooperation potential, as well as scarce satellite-based communication capacities. Moreover, munition stocks and import

dependencies are a well-known issue in which UK-Germany cooperation, potentially with France and probably through MBDA, could increase deterrence and defence capabilities. In the maritime domain, traditional strengths in both navies come into play, namely mine warfare and anti-submarine warfare. As both countries face obsolescence of, for example, their mine warfare vessels in the 2030s, early planning for the retention of this capability should be aligned. Lastly, new instruments could facilitate information exchange, community building and interoperability in the cyber domain, such as closer cooperation on multi- or international cyber challenges.

Contextualising opportunities



Based on our own analysis of capability gaps and important strategic priorities, as well as a brainstorming workshop with subject matter experts from both countries, we collected a broad range of suggestions for future capabilities cooperation between the UK and Germany. We came up with a total of 44 proposals (see Annex).

In order to identify both the low hanging fruit as well as the most useful areas of cooperation, we gave each proposal a score between 1 and 10 for relevance of the project, meaning how useful these capabilities would be to either the UK and Germany as well as NATO. We also evaluated their feasibility, recognising possible political or practical hurdles, and scored them between 1 and 10 too. Based on this analysis, we identified the following three categories of potential cooperation.

Easy but effective

This category of cooperation proposals is both highly feasible because of low barriers to realisation, as well as very relevant because they would address existing capability gaps in British, German and European NATO forces.

1. **Medium-to-long-range precision strike.** Most land-based Western systems for medium-to-long-range strikes (both precision and area-effect) are out-ranged by their Russian counterparts.⁶⁵ At the same time, Western air superiority, the most common Western effect replacement, might not be readily available in a major war between Russia and NATO. Hence, NATO countries will have to invest in ground-based strike capability area. As the artillery element of the Franco-German MGCS is at least 10 to 15 years away from introduction into service, German-British cooperation should investigate improvements of their Multiple Launch Rocket System (MLRS) fleets. Two possibilities stand out: first, the procurement and integration of US ATACMS missiles or its successor; or, second, German participation in selected sub-programmes of the UK's "Complex Weapons Programme", such as the Land Precision Strike and Deep Fires Rocket System. For the future and even longer ranges, Germany and United Kingdom might even consider the development and deployment of a European conventional land-based cruise or ballistic missile capability.⁶⁶ In any case, both should focus their efforts on precision strike capability, as this would enable them to make the most of their limited numbers of weapon systems while other allies still retain more significant quantities of weapon systems for area effect attacks.
2. **Air and missile defence** could become another focal point of German-British and allied attention given that new threats have emerged and the remaining available capabilities in Europe are quite limited. However, it is difficult to recommend specific steps in this area as several unknowns would render them speculative. Among these, there is the question of the still-open German decision on its TLVS air defence system⁶⁷ and at what stage in the NDPP NATO is with regards to its future ideas about focussing on missile defence. Moreover, there are likely different routes to follow for the two dominant airborne threats: small commercial drones in (very) short-range air defence and cruise and ballistic missile on the other end of the spectrum.⁶⁸ However, this also opens avenues for cooperation in both areas. As both countries have close links to the Netherlands, British

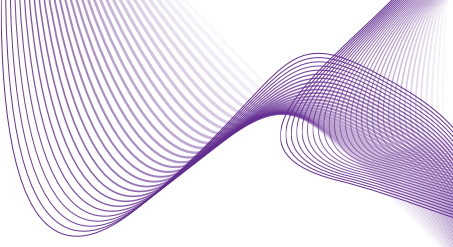
participation, or an observer status, in the German-Dutch Apollo cooperation should be explored.

3. **Cooperation on weapon systems – especially missiles.** As European nations' stocks of precision-guided weapons are traditionally too small and at least Germany is dependent on the US for many missile types, closer cooperation on this issue can easily benefit European defence capability. Germany participation in the UK Complex Weapon Programme or at least selected sub-programmes like Brimstone is one way to do this. As MBDA is one the main partners of the UK in this programme⁶⁹ and a transnational company with extensive experience in multinational programmes, the industrial side is little to no problem here. For other missile types, though, Germany's long-standing delivery partnerships with the US, e.g. in ship-based anti-air missiles, would require political guidance to change, such as in the ongoing planning for the future German air defence frigates F127.⁷⁰

Political symbols/signals

These proposals are more designed to underscore the political value of, and desire for, closer cooperation between the UK and Germany. They are comparatively easy to realise and have some limited impact on capability. The focus, though, is on political signalling.

1. **Cooperation on the C-130 Hercules Squadron.** As France and Germany take their joint C-130 Hercules squadron online by 2024,⁷¹ an institutionalised information, best practice and experience exchange through a seconded RAF exchange officer could be useful to increase the value of this capability. Even though France has its own experience in operating the C-130, a trilateral cooperation could help all three parties to learn from one another. Moreover, as seconded officers are a common element in current cooperation, there should be a procedural template to build upon.
2. **Coordinating the port calls** of German and British (and potentially other European) maritime assets active across the world is a comparatively simple signalling measure to underline European interests and commitments in other parts of the world or show support to like-minded states beyond NATO and the EU, such as Japan, Australia or South Korea. This ranges from ships on a training cruise, to ships conducting freedom-of-navigation operations. Even though there is no immediate capability impact of such cooperation, it is easy to execute and a signal to both allies and adversaries. One step further could be the actual mutual deployment of a group of sailors onboard the other partner's vessels, eg training of German sailors on British ships. This would enable the participation of German soldiers in areas where they usually do not operate – for example, in the Asia-Pacific. Hence, it could infuse these sailors with practical knowledge of the area (beyond current deployment of an officer in the US-Singapore Information Fusion Centre).
3. **Cyber capabilities** have become increasingly important in recent years, as reflected in the establishment of dedicated German and British cyber forces. However,



due to their close links with information, cryptography and command-and-control-related capabilities, these have largely remained national. Moreover, given their novelty, no transnational doctrines and concepts have emerged yet. Building European cyber capabilities and a closer-knit transnational community thus remains a laudable goal. Cyber challenges are one way to achieve this. In a first step, Germany and the UK should more aggressively promote participation of their own and other European forces in the UK's cyber challenges, which are open to international participants. In the near future, a regular, joint British-German cyber challenge specifically for European partners could be a way to better reach the goals outlined above.

Game-changer

These proposals are the most difficult to realise, but promise the largest impact on financial, industrial and capability dimensions. They could profoundly change the game for European military capabilities in some selected areas that now are either very weak or even present considerable gaps. However, significant political investment by Germany, the UK and other partners would be required.

- 1. Multi/binational ISR/ELINT/SIGINT/EW fleet.** Europe has a significant capability gap in ISR, ELINT, SIGINT and EW capabilities. Generating, processing and distributing information is crucial for modern warfare. Herein lies a huge opportunity to increase interdependency between Germany, the United Kingdom, and potentially other allies. Even though NATO did make progress with the effective start of the AGS programme, European ISR and Intelligence, surveillance, target acquisition, and reconnaissance (ISTAR) capabilities are still weak in imagery intelligence (IMINT) and particularly in SIGINT, ELINT and communications intelligence (COMINT).⁷² Multinationalising these capabilities along the lines of other capital-intensive capabilities such as strategic air transport (in the SAC) or air-to-air refuelling (in the MMF) could improve this situation. However, ISR/ELINT/SIGINT capabilities are some of the most sensitive capability areas, where national assets are most protected and information firewalls erected quickly. For the UK, there is the additional hurdle of ensuring compatibility with the Five Eyes agreement. Moreover, the number of partners for such expensive capabilities increases transactional costs. Nevertheless, Germany and the UK could start by extending existing intelligence-sharing agreements that include many allies like the “SIGINT Seniors Europe”.⁷³
- 2. FCAS/Tempest merger.** Obviously, the financial, technological and industrial implications of the respective future combat air systems, FCAS and Tempest, are so significant that a merger of the two projects would shape European aerospace industry and capabilities for decades to come. Furthermore, some observers doubt that it is financially sustainable to pursue both programmes.⁷⁴ Nevertheless, strong industrial and political interests make it unlikely that such a merger would take place. Germany and the UK, as co-leader and leader of the respective programmes should continue to explore opportunities for the joint development of technologies, even if these end up in different systems in the end.⁷⁵

3. **Joint MPA fleet (UK/NOR/DE).** Maritime patrol and anti-submarine capabilities could be another interesting and important area to explore. This is primarily due to the German decision to retire its P-3C Orion early in 2025. This might create an opportunity for cooperation until the future development of the Maritime Airborne Warfare System with France takes off – if it ever does. One option would be for Germany to lease P-8 Poseidon, which would at the very least provide interoperability with Norway and the UK for about 15 years. Another area could be the development or procurement of additional uninhabited systems both in the air and undersea for maritime patrol and anti-submarine warfare, as these are expected to be the logical next step in the development of these two capabilities.

Other opportunities

Another set of opportunities might yield less impact but be easier to realise. Such options include closer coordination of ongoing efforts in future naval mine warfare, more integration of amphibious forces (in conjunction with France and the Netherlands), the integration of UK assets in the European Air Transport Command (EATC) to increase European strategic mobility, R&D/T cooperation for new technologies such as uninhabited ground vehicles (UGVs) and uninhabited naval vehicles (UNVs) and efforts to increase joint munition development and usage with systems such as Meteor and Brimstone. As European stockpiles for such weapons are generally too small,⁷⁷ joint procurements might help to create economies of scale and thus increase the number of missiles per euro or pound spent, though this will not resolve the scarcity issues on its own.

Within the “newer” domains of space and cyberspace, conceptual cooperation and political alignment are probably required before more concrete projects are realistic. In space, for example, both Germany and the United Kingdom need comprehensive national space strategies. For Germany, this means updating its 2010 strategy,⁷⁸ while the UK has to go beyond its current civilian strategy.⁷⁹ Although both see civilian space very much tied to European Space Agency, military space cooperation could be fruitful in their respective search for successor systems for their military communication satellite infrastructure.

Cyber capability is still a relatively new domain for NATO and will grow in importance in the years to come. It was only at the Warsaw summit in 2016 that NATO recognised cyber space as a domain of operations and the need to go beyond simply protecting NATO’s internal networks. NATO actively encourages the development of cyber capabilities, and several member states have committed to developing offensive and defensive cyber effects in NATO operations. Germany and the United Kingdom are among them.⁸⁰ Strategic alignment would be the first order of business here. Germany, for example, has been criticised for not having a clear strategy when it comes to offensive cyber capabilities.⁸¹

Conclusion



Going forward, both partners should adopt a more strategic perspective when it comes to bilateral cooperation – that is, base their decisions on existing or forthcoming capability gaps in their forces and the European pillar of NATO.”

Enhancing European security and defence capabilities is necessary considering the worsening security environment facing the continent. Adapting military capabilities to the renewed NATO focus on deterrence and defence is one of the most challenging tasks facing armed forces that have only just recovered from capability reductions and budget cuts after the last financial crisis in 2008 and now face the next economic crisis. Rebranding and repositioning the “silent alliance” between Germany and the United Kingdom to deliver visible and useable military capabilities will undoubtedly help Europe adapt to these challenges.

However, this ambition is up against severe structural obstacles, as both armed forces have essentially run on “parallel tracks” for the past decades, even though their composition is quite similar. While there is some cooperation in niche capabilities (eg wide wet gap crossing) and some visible armament programmes in which both countries were involved (such as the A400M or the Eurofighter), these are exceptions to the rule.

Going forward, both partners should adopt a more strategic perspective when it comes to bilateral cooperation – that is, base their decisions on existing or forthcoming capability gaps in their forces and the European pillar of NATO. Utilising existing or developing equipment commonalities, UK-German and NATO capability weaknesses and gaps as well as future technologies, thus show the most promise for closer cooperation in equipment. Beyond this, interoperability and information exchanges across domains and services have the potential to increase the overall military effectiveness of both armed forces. Their relevance and strategic impact are limited, though.

Politically, existing cooperation, as well as those opportunities proposed in this study, could serve as the basis for a military cooperation treaty between Germany and the United Kingdom akin to the France-UK Lancaster House Treaty. Of course, both countries can also pursue these kinds of opportunities in other bilateral formats such as the existing Oxford Meetings, or even through multilateral formats like NATO or the Organisation for Joint Armament Cooperation. However, such a treaty would send a strong and visible political signal that the UK remains a key player in continental Europe – a signal that would be important for allies and adversaries alike.

This analysis focuses in particular on efforts to increase cooperation in capabilities. The goal is to take a closer look at current and planned cooperation⁸² to identify possible future avenues of cooperation. We categorised current (highlighted in green), planned (highlighted in yellow), and future (highlighted in blue) avenues of cooperation in the table below (Table 4). We identified existing and planned areas of cooperation across six domains: land, air, maritime, cyber, space, and medical. The analysis distinguishes between four ways of cooperation in the different domains: 1) information exchange, 2) increasing interoperability, 3) armament development (R&D/R/T), 4) joint capability / procurement / maintenance / training. While our analysis up to this point focused largely on capabilities, we included the category of “information exchange” to designate any efforts by Germany and the United Kingdom to keep each other informed about ongoing and planned projects. This includes efforts such as information-sharing in the cyber domain, for example. We also included a separate category for “interoperability” to highlight cooperation in terms of integration, interoperability, and joint exercises. The analysis further distinguishes between joint development and R&D/R&T cooperation and joint procurement and maintenance of capabilities.

**TABLE 4: UK-GERMANY COOPERATION OPPORTUNITIES
IN MILITARY CAPABILITIES ACROSS DOMAINS**

Existing cooperation

Declared cooperation

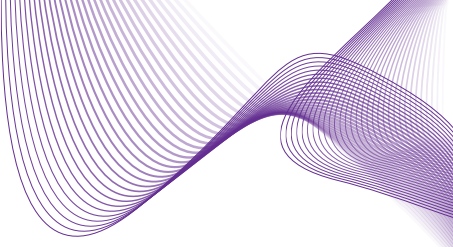
Potential cooperation

	INFORMATION EXCHANGE	INCREASING INTEROPERABILITY	ARMAMENT DEVELOPMENT (R&D/R&T)	JOINT CAPABILITY/PROCUREMENT/ MAINTENANCE
Land	- Expectations and requirements for joint work on wide wet gap crossing are being aligned and requirements harmonised.		- Common R&T activities on emerging main battle tank technologies are being pursued.	- Continue to work with partners on all-terrain vehicle (BvS-10 successor).
		- Enhance interoperability for BOXER and CATV. - Both armies will identify opportunities to develop interoperability of our combat units, but not below battlegroup level. - Co-operation in developing and refining divisional level command with the respective armies and seek to reinforce each other's efforts in support of the NATO Readiness Action Plan.	- BOXER and CATV R&D collaboration. - There is additional scope to cooperate on development of future Artillery systems. - Both armies continue to explore opportunities for a new all-terrain vehicle with partners. ⁸³	- BOXER Joint Maintenance and Procurement of spare parts etc. - On ammunition, national qualification processes are being checked and aligned to prepare the ground for common procurement (incl. 120mm if Challenger 2 LEP decides for smooth-barrel gun). - Potential German-UK collaboration on big-ticket Main Ground Combat System (MGCS) to be discussed in Nov 2020. - Cooperation on uninhabited ground vehicles (with MBDA Brimstone precision strike) being explored. - Explore collaboration on M3 amphibious bridge system successor.
		- Initiate close integration of new ground-based air defence capabilities in both countries as short-to-medium air defence is a critical capability in Europe (TLVS as open architecture and Sky Sabre). Explore partial integration of UK into German-Dutch Project Apollo (doctrines, processes).	- Modernisation/development of medium-to-long-range strike capabilities as both armies lack sufficient indirect fire support caps – explore integration of Germany into UK-US cooperation? ⁸⁴ - Explore fundamental R&D at the materials level for armour protection, R&T at the possibility of a common main armament and munitions. R&D into active defensive aids for armoured vehicles also presents an opportunity for joint work. - Ground-based air defence, and in particular improving European ballistic- and cruise-missile defences, also provides areas that offer the potential for collaboration across the spectrum of technological maturity. ⁸⁵ Also push that topic in NATO. - Explore areas of R&D cooperation in counter UAS technology – VSHORAD DE-NEL Apollo (also see interoperability column). - Think about European project on MLRS update or in the shorter term, joint operation of a US system (also see Joint Capability column).	- With regards to medium-to-long-range strike, investigate deeper cooperation on MLRS as common equipment, eg joint procurement of munition such as ATAMCS missiles or its successor (PrSM ⁸⁶ , Judson, 2018) once introduced into US Army service. - Explore closer cooperation between light infantry/rapid reaction army components (16 Air Assault/Division Schnelle Kräfte/Dutch Luchtmobiele Brigade) to compensate for US withdrawal of Stryker Brigade. - Explore options for closer UK involvement into military mobility plans (PESCO with Netherlands as lead nation, depending on third party regulation) or Joint Support and Enabling Command in Ulm.

INFORMATION EXCHANGE		INCREASING INTEROPERABILITY	ARMAMENT DEVELOPMENT (R&D/R&T)	JOINT CAPABILITY/PROCUREMENT/MAINTENANCE
Air		<ul style="list-style-type: none"> - Enhance Eurofighter interoperability with aim to conduct joint Baltic Air Policing 2023.⁸⁷ 	<ul style="list-style-type: none"> - On Eurofighter, continued collaboration on export campaigns (CHE and FIN). - Continued work on A400M programme. 	
		<ul style="list-style-type: none"> - identify areas for co-operation and increasing interoperability at the tactical level for Eurofighter and A400M (eg base twinning). - Increasing interoperability across the spectrum of air including opportunities for training and exercises. - Explore joint Baltic air policing. - Align capability requirements and plans (eg Future Combat Air, Eurofighter, A400M, Heavy Transport Helicopter etc.). - Additionally, if the Schwerer Transporthubschrauber procurement decision favours the CH-47, there is a potential for enhanced interoperability. 	<ul style="list-style-type: none"> - Explore opportunities to merge FCAS and Tempest programme (very difficult politically). 	<ul style="list-style-type: none"> - Opportunity for German procurement of STRIKER II Digital Helmet.
	<ul style="list-style-type: none"> - Initiate Information and lessons learned exchange between UK and FR/DE on experiences with C-130 as Franco-German unit comes online. 	<ul style="list-style-type: none"> - Closer cooperation in airborne electronic warfare as Germany will buy new EW aircraft, UK enable its Eurofighter. - Pursue joint engineering and aircrew training. 	<ul style="list-style-type: none"> - Regarding Tempest / FCAS integration, think about cooperation on weapons systems rather than the airframe. - Explore German participation in selected weapon development programs in the UK “Complex Weapons Programme”, eg Land Precision Strike and Deep Fires Rocket System to feed into joint medium-to-long-range precision strike capability. - Further joint development of Brimstone air-to-surface once introduced into German service. - further joint development of METEOR (with partners). - Initiate NATO process of looking into AWACS successor as one part to strengthen the alliance’s cruise missile defence. - Initiate work on strengthening NATO cruise missile defence, e.g. through airborne detection (see above) and engagement. 	<ul style="list-style-type: none"> - Explore options of joint anti-submarine warfare/ Maritime Patrol Aircraft capability– given Germany’s coming gap/weakness and UK’s P-8 procurement - Option for Germany to lease P-8s for some years? - Integrate UK transport and tanker assets in respective European (not EU-related) structures (foremost EATC). - Explore options to establish additional multinational (eg NATO) fleets akin to MRTT/SAC/ AWACS on enabler capabilities, foremost ELINT/ SIGINT and ISR aircraft. - As the UK’s Sentinel ISR aircraft are withdrawn from service in 2021,⁸⁸ explore joint solution to mitigate capability gap (e.g. see above or bilateral solution). Manned/unmanned?

	INFORMATION EXCHANGE	INCREASING INTEROPERABILITY	ARMAMENT DEVELOPMENT (R&D/R&T)	JOINT CAPABILITY/PROCUREMENT/MAINTENANCE
Maritime	<ul style="list-style-type: none"> - Navies will dialogue with the Netherlands regarding future amphibious capabilities (2030+). - Navies will continue to exchange views on multiple crew concepts. 	<ul style="list-style-type: none"> - German support of “foreign training” within the Flag Officer Operational Sea Training (FOST)/ German Operational Sea Training (GOST). 		<ul style="list-style-type: none"> - Continue the closer integration of DE Naval Infantry into UK Amphibious cooperation (eg German participation NATO's Amphibious Task Group in NATO Response Force).
	<ul style="list-style-type: none"> - Navies will support multinational discussions on the system-of-systems approach in Naval Mine Warfare and Integrated Air and Missile Defence. 	<ul style="list-style-type: none"> - Reinforce interoperability through their continued support of the European Amphibious Initiative (EAI). - Training cooperation opportunities in terms of FONOPs (SCS), Carrier Group cooperation and High North, GIUK Gap and the Baltic. 	<ul style="list-style-type: none"> - Jointly develop a “Torpedo Defence Next Generation” capability providing surface ships with effective means against all kinds of torpedoes, covering everything from torpedo warning, detection, tracking and verification/classification to engagement. 	
	<ul style="list-style-type: none"> - Closer exchange of ISR information/liaison exchanges on future German SIGINT vessels - alignment of international ship visits on European level -> signalling. 	<ul style="list-style-type: none"> - Regular/consistent integration of DE naval assets into UK Carrier Strike Groups. - training of German sailors on British ships. Participation in missions Germany usually does not operate eg in the Asia-Pacific, could infuse these sailors with practical knowledge of the area (beyond current deployment of an officer in US-Singapore Information Fusion Centre). 	<ul style="list-style-type: none"> - Explore German integration into the FR-UK MMCM programme. Alternatively, explore options for potential convergence of Franco-British MMCM program and the multinational NATO MMCM-NG program, in which Germany takes part. - Future Weapons R&D may offer opportunity, eg the use of lasers for close-in ship defence and naval assets in ballistic-missile defence.⁸⁹ - Development of anti-submarine warfare capabilities, potentially through NATO for underwater/ deep water sensors and effectors for the Atlantic / GIUK gap. - UUV development. 	<ul style="list-style-type: none"> - Explore limited German participation/integration in JEF with regards to amphibious capability (Seebataillon) as cooperation with Netherlands is already very close.
Space				
	<ul style="list-style-type: none"> - Closer exchange of ISR information, eg from German SARah satellites as with EAD.⁹⁰ - Space as a new area offers the opportunity to collaborate early on if coordination is pursued and relationship of trust is established. - Continue coordination on international space policies and norms (frequency allocation, space debris, arms control etc.). 		<ul style="list-style-type: none"> - As both London⁹¹ and Berlin⁹² are looking into the future of their respective space-based communication infrastructure, explore options for closer integration/joint satcom capability. - Explore potential UK role in Germany's development of a space-based early warning and target designation system for missile defence.⁹³ - Once third-party participation is sorted out, explore German-British participation in the similar PESCO-project, “Timely Warning and Interception with Space-Based Theater Surveillance (TWISTER)”.⁹⁴ 	

	INFORMATION EXCHANGE	INCREASING INTEROPERABILITY	ARMAMENT DEVELOPMENT (R&D/R&T)	JOINT CAPABILITY/PROCUREMENT/MAINTENANCE
Cyber	<ul style="list-style-type: none"> - Cyber Defence including information sharing where possible (eg assessments of common threats in cyberspace). - Information activities - Sharing of operating models and practical experience. - Further development of the dialogue and cooperation concerning efficient and effective delivery of geospatial, meteorological, and oceanographic (GeoMETOC) data, support and products. - Deepen Open Source Intelligence . 	<ul style="list-style-type: none"> - Interoperability - Establishment of a common interface for interconnecting respective classified networks for the direct exchange of information - Deepening of the cooperation in Multinational Geospatial Support Group (MN GSG) and in the future Multinational METOC Support Group (MN MSG). - Establishment of a personnel exchange programme -> secondment of personnel between organisations. - Participation in joint exercises with cyber and information domain relevance. 	<ul style="list-style-type: none"> - Cyber Operations - Develop concepts for Cyber Operational Planning and development of doctrines. 	
	<ul style="list-style-type: none"> - Have open discussions about doctrines and concept even beyond institutional barrier and align across ministries. - Need to intensify dialogue on highest level of ministries as well as the working level in order to build trust. - Encourage the development of standards in cyber policy. 	<ul style="list-style-type: none"> - Initiate a DE-UK cyber challenge (open to all EU and NATO allies), like the US DARPA's 'Cyber Grand Challenge' to facilitate cyber-security community building in Europe (Schütz, von Voss, 2018.⁹⁵ - Further encourage participation of European and NATO allies in already existing national challenges in the UK. 	<ul style="list-style-type: none"> - Develop joint research projects on AI. 	
Medical	<ul style="list-style-type: none"> - Cooperation in military medical research through established relationship between DMS Medical Director and the MilMed Academy in Munich. - Share information on medical capability development projects. - Establish links between Royal Centre of Defence Medicine and the Bundeswehr Hospital in Hamburg for collaboration in Role for medical support. 	<ul style="list-style-type: none"> - Will seek to foster interoperability across the scope of medical capabilities in NATO context. - German participation in the COMBINED JOINT ATLANTIC SERPENT exercise. - Use relationship between UK/GER medical units to foster joint simulation, training, and exercises in a trilateral format with the US. - Collaborative partnerships across the Operational Patient Care Pathway to facilitate interoperability. 		

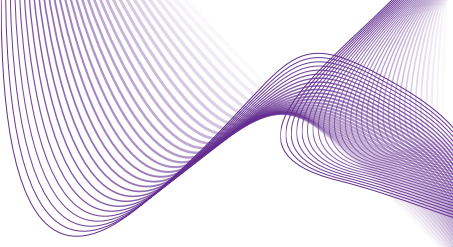


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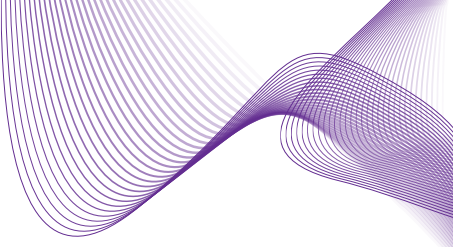
NO.	NAME	INSTITUTION
1	Becker, Sophia	DGAP
2	Brown, Lawrence	UK Ministry of Defence
3	Giegerich, Bastian	IISS
4	Jelley, David	UK Ministry of Defence
5	Mölling, Christian	DGAP
6	Nebe, Jack	FCO
7	O'Neill, Paul	RUSI
8	Phuong, Angela	UK Ministry of Defence
9	Richter, Anja	Hanns Seidel Stiftung
10	Rider, Rob	Defence Attaché, FCO, UK Embassy Berlin
11	Schütz, Torben	DGAP

References

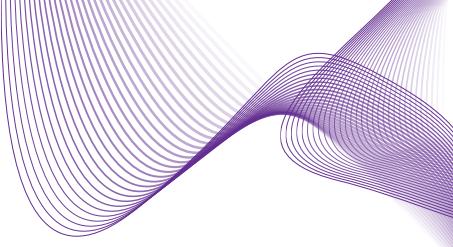
1. Saxi, H. L., 2019. British-German Defence and Security Relations After Brexit: Quo Vadis, 'Silent Alliance'?, in Johnson, R. and Matlary, J.H. (eds.). The United Kingdom's Defence After Brexit- Britain's Alliances, Coalitions, and Partnerships, Palgrave Macmillan.
2. Becker, S., Moelling, C. and Schuetz, T., 2020, April. Deterrence and Defense in Times of Covid-19 – Europe's Political Choices, German Council on Foreign Relations, Policy Brief No. 9. Available at: https://dgap.org/sites/default/files/article_pdfs/dgap-policybrief-2020-09-en.pdf [Accessed 19 July 2020].
3. Shevin-Coetzee, M., 2019. *An Overlooked Alliance: A Case For Greater UK-German Defence Cooperation*. [online] Europeanleadershipnetwork.org. Available at: <https://www.europeanleadershipnetwork.org/commentary/an-overlooked-alliance-a-case-for-greater-uk-german-defence-cooperation/> [Accessed 8 August 2020].
4. See e.g. Barrie, D., Barry, B., Boyd, H., Chagnaud, M., Childs, N., Moelling, C. and Schuetz, T., 2018. Protecting Europe: Meeting The EU'S Military Level Of Ambition In The Context Of Brexit. IISS / DGAP. Available at: https://dgap.org/system/files/article_pdfs/protecting_europe.pdf [Accessed 20 July 2020].
5. Bundesregierung, 2016. Weißbuch 2016 zur Sicherheitspolitik und zur Zukunft der Bundeswehr. Berlin: Bundesministerium der Verteidigung. Available at: <https://www.bmvg.de/resource/blob/13708/015be272f-8c0098f1537a491676bfc31/weissbuch2016-barrierefrei-data.pdf> [Accessed 19 July 2020].
6. HM Government, 2015. National security strategy and strategic defence and security review 2015: A secure and prosperous United Kingdom. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/478933/52309_Cm_9161_NSS_SD_Review_web_only.pdf [Accessed 19 July 2020].
7. See Bundesregierung, 2006. Weißbuch 2006 - Zur Sicherheitspolitik Deutschlands und zur Zukunft der Bundeswehr. Berlin: Bundesregierung. Available at: http://archives.livreblancdefenseetsecurite.gouv.fr/2008/IMG/pdf/weissbuch_2006.pdf [Accessed 19 July 2020]. & HM Government, 2010. A strong Britain in an Age of Uncertainty: The National Security. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/61936/national-security-strategy.pdf [Accessed 19 July 2020].
8. HM Government, 2010. A strong Britain in an Age of Uncertainty: The National Security. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/61936/national-security-strategy.pdf [Accessed 19 July 2020].
9. NATO, 2010. Active Engagement, Modern Defence – Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization, adopted by Heads of State and Government at the NATO summit in Lisbon, 19-20 Nov 2010. Available at: https://www.nato.int/nato_static_f2014/assets/pdf/pdf_publications/20120214_strategic-concept-2010-eng.pdf [Accessed 14 August 2020].

- 
10. NATO, 2010. Active Engagement, Modern Defence – Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization, adopted by Heads of State and Government at the NATO summit in Lisbon, 19-20 Nov 2010. Available at: https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_publications/20120214_strategic-concept-2010-eng.pdf [Accessed 14 August 2020].
 11. Palmer, D.A.R., 2016. The Framework Nations' Concept and NATO: Game Changer for a New Strategic Era Or Missed Opportunity?. Rome: NATO Defense College, p.16. Available at: <http://www.ndc.nato.int/news/news.php?i-code=965> [Accessed 14 August 2020].
 12. Frisell, E.H. and Sjökvist, E., 2019. Military Cooperation around Framework Nations. Swedish Defence Research Institute, p.16. Available at: <https://www.foi.se/rest-api/report/FOI-R--4672--SE> [Accessed 08 August 2020].
 13. Europäische Sicherheit & Technik, 2020. Die Clusterlandschaft des deutschen Framework Nations Concept. Available at: <https://esut.de/2020/02/fachbeitraege/streitkraefte-fachbeitraege/18087/das-rahmennationenkonzept-multinationale-faehigkeitsentwicklung-und-operativer-mehrwert/attachment/grafik-1/> [Accessed 08 August 2020].
 14. Frisell, E.H. and Sjökvist, E., 2019. Military Cooperation around Framework Nations. Swedish Defence Research Institute, p.18. Available at: <https://www.foi.se/rest-api/report/FOI-R--4672--SE> [Accessed 08 August 2020].
 15. Frisell, E.H. and Sjökvist, E., 2019. Military Cooperation around Framework Nations. Swedish Defence Research Institute, p.15. Available at: <https://www.foi.se/rest-api/report/FOI-R--4672--SE> [Accessed 08 August 2020].
 16. Frisell, E.H. and Sjökvist, E., 2019. Military Cooperation around Framework Nations. Swedish Defence Research Institute, p.24. Available at: <https://www.foi.se/rest-api/report/FOI-R--4672--SE> [Accessed 08 August 2020].
 17. Frisell, E.H. and Sjökvist, E., 2019. Military Cooperation around Framework Nations. Swedish Defence Research Institute, p.28. Available at: <https://www.foi.se/rest-api/report/FOI-R--4672--SE> [Accessed 08 August 2020].
 18. Frisell, E.H. and Sjökvist, E., 2019. Military Cooperation around Framework Nations. Swedish Defence Research Institute, p.31. Available at: <https://www.foi.se/rest-api/report/FOI-R--4672--SE> [Accessed 08 August 2020].
 19. Barrie, D. and Hardwidge, J., 2019, The EU's PESCO: here to stay?, IISS, Military Balance Blog, <https://www.iiss.org/blogs/military-balance/2019/12/eu-pesco-hurdles> [Accessed June 23, 2020]
 20. See e.g. Mölling, C. and Schütz, T., 2018. European Armament Collaboration: What We Can Learn from History and Concepts. In: N. Karampekios, I. Oikonomou and E. Carayannis, ed., The Emergence of EU Defense Research Policy – From Innovation to Militarization, 1st ed. Cham: Springer International Publishing.
 21. Liam, 2018. British Army Amphibious Engineers Will Stay In Germany. [online]

- Warfare.Today. Available at: <http://www.warfare.today/2018/07/19/british-army-amphibious-engineers-will-stay-in-germany/> [Accessed 20 July 2020].
22. NATO, 2019. Defence Expenditure of NATO Countries (2013-2019). Brussels: NATO Press & Media, p.7. Available at: https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2019_11/20191129_pr-2019-123-en.pdf [Accessed 19 July 2020].
 23. NATO, 2019. Defence Expenditure of NATO Countries (2013-2019). Brussels: NATO Press & Media, p.7. Available at: https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2019_11/20191129_pr-2019-123-en.pdf [Accessed 19 July 2020].
 24. Conservative Party, 2019. Get Brexit Done. Unleash Britain's potential, p.53. Available at: https://assets-global.website-files.com/5da42e2cae7ebd3f8b-de353c/5dda924905da587992a064ba_Conservative%202019%20Manifesto.pdf [Accessed 14 August 2020].
 25. Zeit. 2019. Deutschlands Verteidigungsausgaben steigen um fünf Milliarden Euro. [online] Available at: <https://www.zeit.de/politik/ausland/2019-05/nato-verteidigungsausgaben-deutschland-budgeterhoehung> [Accessed 19 July 2020].
 26. NATO, 2019. Defence Expenditure of NATO Countries (2013-2019). Brussels: NATO Press & Media, p.3. Available at: https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2019_11/20191129_pr-2019-123-en.pdf [Accessed 19 July 2020].
 27. European Union, 2017. Notification on Permanent Structure Cooperation (PESCO), Annex II. [online] Available at: <https://www.consilium.europa.eu/media/31511/171113-pesco-notification.pdf> [Accessed 19 July 2020].
 28. NATO, 2019. Defence Expenditure of NATO Countries (2013-2019). Brussels: NATO Press & Media, p.13. Available at: https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2019_11/20191129_pr-2019-123-en.pdf [Accessed 19 July 2020].
 29. For the UK see: Barrie, D., 2019. UK Defence-Budget Boost Provides Short-Term Relief, But Uncertainty Looms. [online] IISS. Available at: <https://www.iiiss.org/blogs/military-balance/2019/09/uk-defence-budget-boost> [Accessed 19 July 2020]. For Germany see: Jungholt, T., 2020. Hans-Peter Bartels: „Die Bundeswehr Benötigt Bis 2031 Über 200 Milliarden Euro – Nur Für Material“. [online] DIE WELT. Available at: <https://www.welt.de/politik/deutschland/article208039329/Hans-Peter-Bartels-Die-Bundeswehr-benoetigt-bis-2031-ueber-200-Milliarden-Euro-nur-fuer-Material.html> [Accessed 20 July 2020]. See also: Szymanski, M., 2020. Regierung plant mehr als 130 Milliarden für Militärprojekte. Available at: <https://www.sueddeutsche.de/politik/bundeswehr-ruestung-verteidigung-1.4917283> [Accessed 13 August 2020].
 30. Edmunds, T., Dawes, A., Higate, P., Jenkins, K. and Woodward, R., 2016. Reserve forces and the transformation of British military organisation: soldiers, citizens and society. *Defence Studies*, 16(2), p.120. Available at: <https://doi.org/>

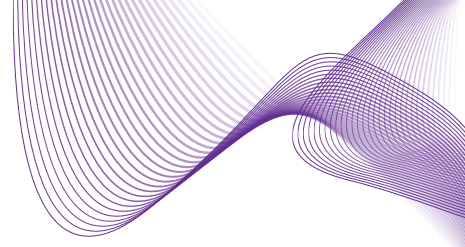
- 
- [10.1080/14702436.2016.1163225](https://doi.org/10.1080/14702436.2016.1163225) [Accessed 14 August 2020].
31. Axe, D., 2020. 'Out-Gunned And Out-Ranged'—Britain Could Cut 20,000 Soldiers Plus Airlifters And Helicopters. Forbes. Available at: <https://www.forbes.com/sites/davidaxe/2020/07/07/out-gunned-and-out-ranged-london-could-cut-20000-soldiers-plus-airlifters-and-helicopters/#205b08c11c9b> [Accessed 14 August 2020].
 32. Bundeswehr, 2020. Die Organisation der Bundeswehr. [online] bundeswehr.de Available at: <https://www.bundeswehr.de/de/organisation> [Accessed 19 July 2020].
 33. See e.g. HM Government, n.a. Defence Medical Services. Available at: <https://www.gov.uk/government/groups/defence-medical-services> [Accessed 19 July 2020].
 34. Barry, B., 2020. New UK Strategic Command Faces Early Challenges. IISS.
 35. HM Government, 2015. National Security Strategy and Strategic Defence and Security Review 2015 – A Secure and Prosperous United Kingdom, p.9. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/478933/52309_Cm_9161_NSS_SD_Review_web_only.pdf [Accessed 19 July 2020].
 36. Bundesministerium der Verteidigung, 2018. *Konzeption der Bundeswehr*. Berlin: Bundesministerium der Verteidigung, p.31. Available at: <https://www.bmvg.de/resource/blob/26544/9ceddf6df2f48ca87aa0e3ce2826348d/20180731-konzeption-der-bundeswehr-data.pdf> [Accessed 19 July 2020].
 37. For Tornado see: Luck, A., 2020. Squaring the Circle: The Replacement of the German Luftwaffe's Tornado. [online] fpri.org. Available at: <https://www.fpri.org/article/2020/05/squaring-the-circle-the-replacement-of-the-german-luft-waffes-tornado/> [Accessed 19 July 2020]. For P-3C see: Zwerger, P., 2020. Keine Modernisierung: Marineflieger Mustern Die P-3C Orion 2025 Aus. [online] Flugrevue.de. Available at: <https://www.flugrevue.de/militaer/keine-modernisierung-marineflieger-mustern-die-p-3c-orion-2025-aus/> [Accessed 20 July 2020].
 38. Watling, J., 2019. The Future Of Fires - Maximising The UK'S Tactical And Operational Firepower. RUSI Occasional Paper. Available at: https://rusi.org/sites/default/files/op_201911_future_of_fires_watling_web_0.pdf [Accessed 20 July 2020].
 39. Ministry of Defence, 2020. *The Defence Equipment Plan 2019*. London: UK Ministry of Defence, p.64. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/868076/20200218_EP19_v1_1-O.PDF [Accessed 19 July 2020].
 40. Mölling, C., Schütz, T., Stanley-Lockman, Z., 2019. A New Dimension of Air-Based Threats – Germany, the EU and NATO Need New Political Initiatives and Military Defense Systems. Available at: https://dgap.org/system/files/article_pdfs/2019-08-dgapkompakt.pdf [Accessed 19 July 2020].

41. Deutsche Welle. 2015. German Army To Withdraw Patriot Missiles From Turkey Border. [online] Available at: <https://www.dw.com/en/german-army-to-withdraw-patriot-missiles-from-turkey-border/a-18650837> [Accessed 20 July 2020].
42. Royal Airforce, 2020. Poseidon MRA1 | Royal Air Force. [online] Royal Air Force. Available at: <https://www.raf.mod.uk/aircraft/poseidon-mra1/> [Accessed 20 July 2020].
43. Wiegold, T., 2020. Aus Für Jester: Bundeswehr Stoppt Modernisierung Der Seeaufklärer, Neues Flugzeug Gesucht (Nachtrag) – Augen Geradeaus!. Augengeradeaus.net. Available at: <https://augengeradeaus.net/2020/06/aus-fuer-jester-bundeswehr-stoppt-modernisierung-der-seeaufklaerer-neues-flugzeug-gesucht/> [Accessed 19 July 2020].
44. Bundesministerium der Verteidigung, 2020. 11. Bericht des Bundesministeriums der Verteidigung zu Rüstungsangelegenheiten. Berlin: Bundesministerium der Verteidigung, p.85f. Available at: <https://www.bmvg.de/resource/blob/263830/274c9b18032991fe3233bf1770ce22a5/200200609-download-11-bericht-des-bmvg-zu-ruestungsangelegenheiten-data.pdf> [Accessed 19 July 2020].
45. Luck, A., 2020. Squaring the Circle: The Replacement of the German Luftwaffe's Tornado. Foreign Policy Research Institute. Available at: <https://www.fpri.org/article/2020/05/squaring-the-circle-the-replacement-of-the-german-luftwaffes-tornado/> [Accessed 19 July 2020].
46. Williams, M., 2020. New British Carriers Can Transform Europe's NATO Naval Capabilities - Atlantic Council. Atlantic Council. Available at: <https://www.atlanticcouncil.org/blogs/new-atlanticist/new-british-carriers-can-transform-europes-nato-naval-capabilities/> [Accessed 19 July 2020].
47. Europäische Sicherheit & Technik, 2019. Amphibische Kampfboote Für Das Seebataillon – Ein Fähigkeitszugewinn (Nicht Nur) Für Die Ostsee. Available at: <https://esut.de/en/2019/04/fachbeitraege/streitkraefte-fachbeitraege/11701/amphibische-kampfboote-fuer-das-seebataillon-ein-faehigkeitszugewinn-nicht-nur-fuer-die-ostsee/> [Accessed 20 July 2020].
48. EDA, 2019. Strategic Context Cases. European Defence Agency. Available at: <https://www.eda.europa.eu/docs/default-source/eda-factsheets/2019-10-25-factsheet-scc> [Accessed 20 July 2020].
49. Schroeder, W., 2019. NATO at Seventy: Filling NATO's Critical Defense-Capability Gaps. Atlantic Council. Available at: https://www.atlanticcouncil.org/wp-content/uploads/2019/04/NATO_at_Seventy-Filling_NATOs_Critical_Defense-Capability_Gaps.pdf [Accessed 20 July 2020].
50. Barrie, D., Barry, B., Boyd, H., Chagnaud, M., Childs, N., Moelling, C. and Schuetz, T., 2018. Protecting Europe: Meeting The EU'S Military Level Of Ambition In The Context Of Brexit. IISS / DGAP, p.7ff. Available at: https://dgap.org/system/files/article_pdfs/protecting_europe.pdf [Accessed 20 July 2020].
51. See e.g. Barrie, D., Barry, B., Boyd, H., Chagnaud, M., Childs, N., Moelling, C.

- 
- and Schuetz, T., 2018. Protecting Europe: Meeting The EU'S Military Level Of Ambition In The Context Of Brexit. IISS / DGAP, p.16. Available at: https://dgap.org/system/files/article_pdfs/protecting_europe.pdf [Accessed 20 July 2020].
52. Schroeder, W., 2019. NATO at Seventy: Filling NATO's Critical Defense-Capability Gaps. Atlantic Council, p.25ff. Available at: https://www.atlanticcouncil.org/wp-content/uploads/2019/04/NATO_at_Seventy-Filling_NATOs_Critical_Defense-Capability_Gaps.pdf [Accessed 20 July 2020].
53. Barrie, D., Béraud-Sudreau, L., Boyd, H., Childs, N., Giegerich, B., Hackett, J. and Nouwens, M., 2020. European Defence Policy In An Era Of Renewed Great-Power Competition. IISS, p.13. Available at: <https://www.iiss.org/blogs/research-paper/2020/02/the-future-of-european-defence> [Accessed 19 July 2020].
54. Breaking Defense, 2019. Mind The Gap: The Army Looks To A New Assault Bridge For Heavy Armor Maneuvers In Europe. Available at: <https://breakingdefense.com/2019/10/mind-the-gap-the-army-looks-to-a-new-assault-bridge-for-heavy-armor-maneuvers-in-europe/> [Accessed 8 August 2020].
55. Alleslev, L., 2019. NATO Anti-Submarine Warfare: Rebuilding Capability, Preparing for the Future. NATO, p.10ff. Available at: <https://www.nato-pa.int/document/2019-nato-anti-submarine-warfare-rebuilding-capability-preparing-future-alleslev-150-stc> [Accessed 19 July 2020].
56. Schroeder, W., 2019. NATO at Seventy: Filling NATO's Critical Defense-Capability Gaps. Atlantic Council, p.24. Available at: https://www.atlanticcouncil.org/wp-content/uploads/2019/04/NATO_at_Seventy-Filling_NATOs_Critical_Defense-Capability_Gaps.pdf [Accessed 20 July 2020].
57. Giegerich, B., Childs, N. and Hackett, J., 2018. Military Capability And International Status. IISS. Available at: <https://www.iiss.org/blogs/military-balance/2018/07/military-capability-and-international-status> [Accessed 20 July 2020].
58. NATO, 2020. AWACS: NATO's 'eyes in the sky'. Available at: https://www.nato.int/cps/en/natolive/topics_48904.htm [Accessed 19 July 2020].
59. NATO, 2019. Alliance Ground Surveillance (AGS). Available at: https://www.nato.int/cps/en/natolive/topics_48892.htm [Accessed 19 July 2020].
60. NATO, 2019. Multi Role Tanker Transport Capability (MRTT-C).
61. Sacprogram.org. 2020. The Strategic Airlift Capability. Strategic Airlift Capability. Available at: https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2019_10/20191022_1910-factsheet-mrts.pdf [Accessed 19 July 2020].
62. As signified by flagship cooperation projects past and present, from Eurofighter to the Main Ground Combat System.
63. Barrie, D., 2018. Opportunities for defence-industrial collaboration after Brexit. IISS, p.2. Available at: <https://www.iiss.org/-/media/images/comment/military-balance-blog/2018/june/opportunities-for-defence-industrial-collabora->

[tion-after-brex-it-iiss-dgap.pdf](#) [Accessed 19 July 2020].

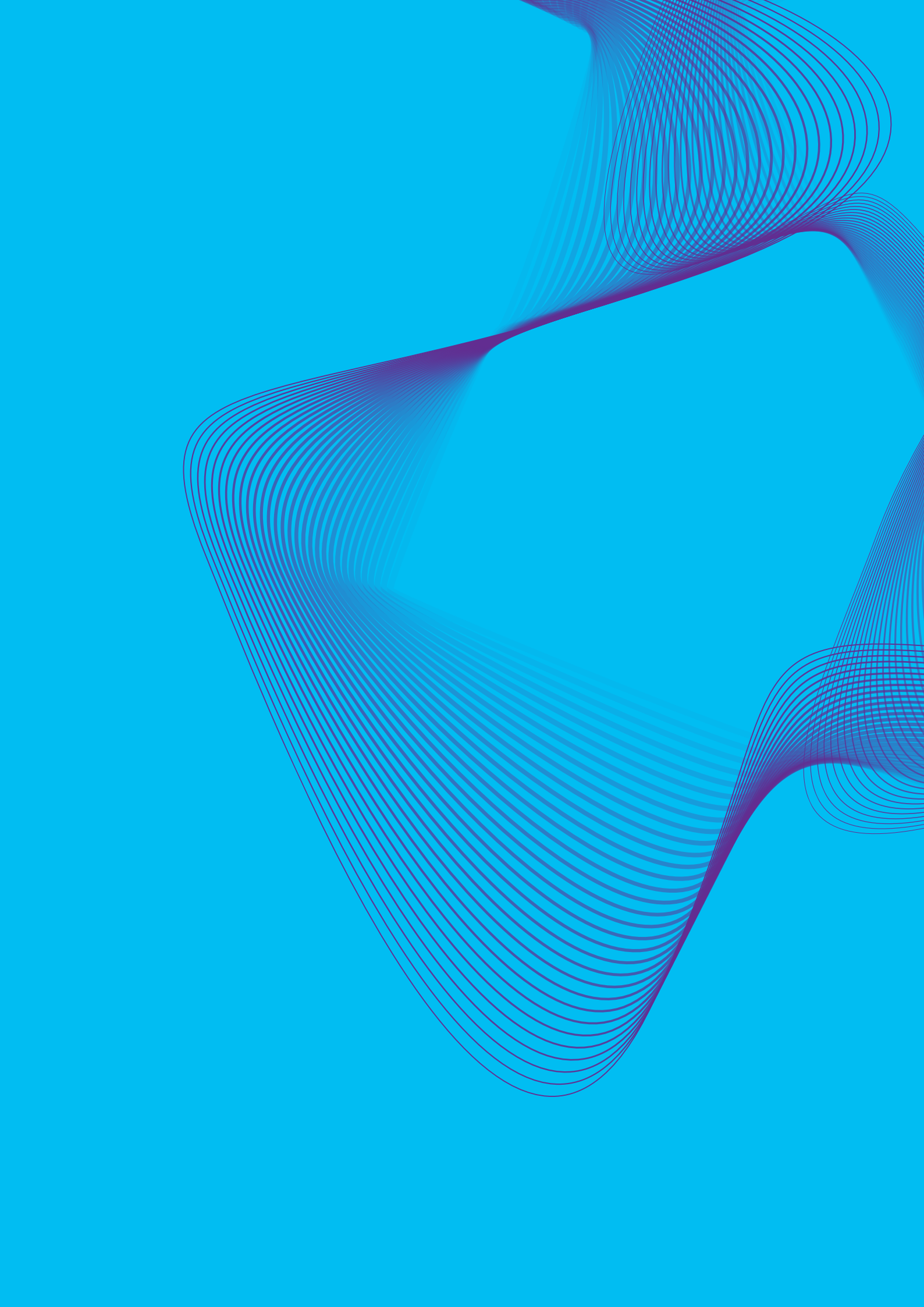
64. McLeary, P., Freedberg Jr., S.J., 2020. US & UK Ink Pact On Next-Gen Aircraft, Long-Range Missiles. Breaking Defense. Available at: <https://breaking-defense.com/2020/07/us-uk-ink-pact-on-next-gen-aircraft-precision-weapons/> [Accessed 14 August 2020].
65. Gordon, J., Mikolic-Torreira, I., Barnett, S., Best, K., Boston, S., Madden, D., Tarraf, D., Willcox, J., 2019. Army Fires Capabilities for 2025 and Beyond. RAND, p.22. Available at: https://www.rand.org/content/dam/rand/pubs/research_reports/RR2100/RR2124/RAND_RR2124.pdf [Accessed 19 July 2020].
66. Simón, L., Lanoszka, A., 2020. The Post-INF European Missile Balance: Thinking About NATO's Deterrence Strategy. Texas National Security Review. Available at: <https://tnsr.org/2020/05/the-post-inf-european-missile-balance-thinking-about-natos-deterrence-strategy/> [Accessed 20 July 2020].
67. Sprenger, S., 2020. It's do or die for Germany's new missile defense weapon. Defense News. Available at: <https://www.defensenews.com/global/europe/2020/07/17/its-do-or-die-for-germanys-new-missile-defense-weapon/> [Accessed 20 July 2020].
68. Mölling, C., Schütz, T., Stanley-Lockman, Z., 2019. A New Dimension of Air-Based Threats – Germany, the EU and NATO Need New Political Initiatives and Military Defense Systems. DGAP. Available at: https://dgap.org/system/files/article_pdfs/2019-08-dgapkompakt.pdf [Accessed 19 July 2020].
69. Ministry of Defence, 2020. The Defence Equipment Plan 2019. London: UK Ministry of Defence, p.44f. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/868076/20200218_EP19_v1_1-O.PDF [Accessed 19 July 2020].
70. Uhl, A., 2020. Fregatte F 127 – Die Nächste Generation Der Luftverteidigung. ESUT - Europäische Sicherheit & Technik. Available at: <https://esut.de/2020/01/fachbeitraege/ruestung/17877/fregatte-f127-naechste-generation-luftverteidigung/> [Accessed 8 August 2020].
71. EDA, 2018. French German common C130J squadron. European Defence Agency. Available at: https://eda.europa.eu/docs/default-source/events/mac2018/1-2_c130j-introduction-of-a-new-aircraft-in-a-multinational-emar-env---fr-de-maa.pdf [Accessed 08 August 2020].
72. Schütz, T., 2019. Der Vernetzte Krieg - Warum Moderne Streitkräfte Von Elektronischer Kampfführung Abhängen. DGAP, p.4. Available at: https://dgap.org/system/files/article_pdfs/2019-17-DGAPkompakt.pdf [Accessed 20 July 2020].
73. Kniep, R., 2016. From the “Five Eyes” to the “SIGINT Seniors Europe”: The intelligence community as a transnational field. AoIR Selected Papers of Internet Research, 60. doi: 10.5210/spir.v6i0.8620.
74. Brzozowski, A., 2019. Europe's Fighter Jets Of The Future On Collision Course?. EURACTIV. Available at: <https://www.euractiv.com/section/aero-space/news/europes-fighter-jets-of-the-future-on-collision-course/> [Accessed 8



August 2020].

75. Donald, D., 2020. Europe On Course For Two Future Combat Programs. Aviation International News. Available at: <https://www.ainonline.com/aviation-news/defense/2020-07-22/europe-course-two-future-combat-programs> [Accessed 8 August 2020].
76. Perkins, W. A., 2017. Enabling Maritime ISR through the 'Family of Systems'. JAPCC. Available at: <https://www.japcc.org/enabling-maritime-isr-through-the-family-of-systems/> [Accessed 13 August 2020].
77. Owen, R., 2015. The U.S. Experience: National Strategy and Campaign Support. In: K. Mueller, ed., Precision and Purpose – Airpower in the Libyan Civil War, 1st ed., p.101. Available at: https://www.rand.org/content/dam/rand/pubs/research_reports/RR600/RR676/RAND_RR676.pdf [Accessed 19 July 2020].
78. Bundesministerium für Wirtschaft und Energie, 2020. Die Raumfahrtstrategie der Bundesregierung. Berlin: Bundesministerium für Wirtschaft und Energie. Available at: <https://www.bmwi.de/Redaktion/DE/Artikel/Technologie/raumfahrtstrategie-bundesregierung.html> [Accessed 19 July 2020].
79. Shave, N., 2020. Urgent Need for Coherent Cross Government Space Strategy. ukospace.org. Available at: <https://www.ukspace.org/urgent-need-for-coherent-cross-government-space-strategy/> [Accessed 20 July 2020].
80. Davis, S., 2019. NATO in the cyber age: Strengthening Security & Defence, stabilising deterrence, General Report. NATO Parliamentary Assembly. Available at: <https://www.nato-pa.int/document/2019-nato-cyber-age-strengthening-security-and-defence-stabilising-deterrence> [Accessed 19 July 2020].
81. Herpig, S., Schulze, M., 2018. Germany Develops Offensive Cyber Capabilities Without A Coherent Strategy of What to Do With Them. Council on Foreign Relations. Available at: <https://www.cfr.org/blog/germany-develops-offensive-cyber-capabilities-without-coherent-strategy-what-do-them> [Accessed 20 July 2020].
82. Information about current and planned cooperation is based on interviews by the authors with German and British personnel.
83. Finabel, 2019. A joint European project – The development and acquirement of new generation all-terrain vehicles. [online] finabel.org. Available at: <https://finabel.org/a-joint-european-project-the-development-and-acquirement-of-new-generation-all-terrain-vehicles/> [Accessed 19 July 2020].
84. Fisher, L., 2020. Britain And US Have Announced Joint Army Modernisation Agreement Today, Mod Says. [online] Twitter.com. Available at: https://twitter.com/LOS_Fisher/status/1283000564452921346 [Accessed 20 July 2020].
85. Barrie, D., 2018. Opportunities for defence-industrial collaboration after Brexit. [online] iiss.org. Available at: <https://www.iiss.org/-/media/images/comment/military-balance-blog/2018/june/opportunities-for-defence-industrial-collaboration-after-brex-it-iiss-dgap.pdf> [Accessed 19 July 2020], p.4.
86. Judson, J., 2020. Army pushes to get Precision Strike Munition to the force by

2023. Defense News. [online] Available at: <https://www.defensenews.com/digital-show-dailies/ausa/2018/10/08/army-pushes-to-get-precision-strike-munition-to-the-force-by-2023/> [Accessed 20 July 2020].
87. Kaiser, C.; Pfingsten, S. 2020. Plug & Fight: Deutsche und Briten üben gemeinsam in Litauen. [online] bundeswehr.de. Available at: <https://www.bundeswehr.de/de/organisation/luftwaffe/aktuelles/plugin-fight-deutsche-und-briten-ueben-gemeinsam-in-litauen-763868> [Accessed 27 July 2020].
 88. Royal Airforce, 2020. Sentinel R1, Royal Air Force. [online] Available at: <https://www.raf.mod.uk/aircraft/sentinel-r1/> [Accessed 20 July 2020].
 89. Barrie, D., 2018. Opportunities for defence-industrial collaboration after Brexit. [online] iiss.org. Available at: <https://www.iiss.org/-/media/images/comment/military-balance-blog/2018/june/opportunities-for-defence-industrial-collaboration-after-brex-it-iiss-dgap.pdf> [Accessed 19 July 2020], p.4.
 90. Deutsch-Französischer Ministerrat, 2017. [PDF] Paris. Available at: https://www.france-alle-magne.fr/IMG/pdf/263-17-langversion_erklarung_ministerrat.pdf [Accessed 20 July 2020].
 91. Ministry of Defence, 2019. *Accounting Officer Assessment – Skynet 6*. London: Ministry of Defence. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/841624/20191022_-_Skynet_6_AOA.pdf [Accessed 19 July 2020].
 92. Bundesministerium der Verteidigung, 2019. *9. Bericht des Bundesministeriums der Verteidigung zu Rüstungsangelegenheiten*. Berlin: Bundesministerium der Verteidigung. Available at: <https://www.bmvg.de/resource/blob/54340/82339068e6d-530deb2281b13b2aed201/20180319-9-bericht-des-bmvg-zu-ruestungsangelegenheiten-data.pdf> [Accessed 19 July 2020].
 93. Bundesministerium der Verteidigung, 2020. *11. Bericht des Bundesministeriums der Verteidigung zu Rüstungsangelegenheiten*. Berlin: Bundesministerium der Verteidigung. Available at: <https://www.bmvg.de/resource/blob/263830/274c9b18032991fe3233bf1770ce22a5/200200609-download-11-bericht-des-bmvg-zu-ruestungsangelegenheiten-data.pdf> [Accessed 19 July 2020], p.34.
 94. PESCO, 2020. PESCO PROJECTS - TIMELY WARNING AND INTERCEPTION WITH SPACE-BASED THEATER SURVEILLANCE (TWISTER), [online], pesco.europa.eu, Available at: <https://pesco.europa.eu/project/timely-warning-and-interception-with-space-based-theater-surveillance-twister/> [Accessed 23 July 2020].
 95. Schütz, T./von Voss, A., 2018. The UK's potential role in enabling EU-NA-TO cooperation after Brexit. [online] iiss.org. Available at: <https://www.iiss.org/-/media/images/comment/military-balance-blog/2018/june/uks-potential-role-in-enabling-eunato-cooperation-after-brex-it-iiss-dgap.ashx> [Accessed 20 July 2020], p.3.





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