



House of Commons  
Defence Committee

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# Unclear for take-off? F-35 Procurement: Responses to the Committee's Second Report

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**Fifth Special Report of Session  
2017–19**

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## The Defence Committee

The Defence Committee is appointed by the House of Commons to examine the expenditure, administration, and policy of the Ministry of Defence and its associated public bodies.

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### Powers

The committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No 152. These are available on the Internet via [www.parliament.uk](http://www.parliament.uk).

### Publications

Committee reports are published on the Committee's website at [www.parliament.uk/defcom](http://www.parliament.uk/defcom) and in print by Order of the House.

Evidence relating to this report is published on the [inquiry page](#) of the Committee's website.

### Committee staff

Mark Etherton (Clerk), Dr Adam Evans (Second Clerk), Martin Chong, David Nicholas, Eleanor Scarnell, and Ian Thomson (Committee Specialists), Sarah Williams (Senior Committee Assistant), and Carolyn Bowes and Arvind Gunnoo (Committee Assistants).

### Contacts

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# Fifth Special Report

On 19 December 2017, the Defence Committee published its Second Report of Session 2017–19, [Unclear for take-off? F-35 Procurement](#) [HC 326]. The Government's response was received on 16 February 2018 and the Lockheed Martin response was received on 2 February 2018. The two responses are appended to this report.

## Appendix 1: Government Response

The Government welcomes the House of Commons Defence Committee's report on F-35 Procurement and the Committee's recognition of the challenge of delivering the largest and most complex international defence programme in history. The Government remains committed to delivering the F-35 programme on time and within budget, providing a cutting-edge capability for the Armed Forces in their defence and security of the United Kingdom.

We wish to clarify a reference made in the report to the UK Government's policy commitment regarding F-35 in the 2015 Strategic Defence and Security Review (SDSR 15).<sup>1</sup> In SDSR 15, the Government committed to "maintain its plan to buy 138 F-35 Lightning aircraft over the life of the programme".<sup>2</sup> Beyond the first 48 F-35 'B' variants in the 10-year Equipment Plan, analysis is under way to determine the choice of variant of the remaining 90 F-35s that meets both Combat Air and Carrier Strike requirements.

The Government's formal response to the Committee's recommendations and conclusions is set out below. The Committee's findings are in bold, with the Government's response in plain text. For ease of reference, paragraph numbering follows that in the "Conclusions and Recommendations" of the Committee's report.

### Reported communications and software issues

**1. We are pleased that the Government acknowledges the potential value of using the Multifunctional Advanced Data Link (MADL) for secure communications between the F-35 and our older aircraft. We note both that it is the MoD's ambition to have MADL-type capabilities across the carrier group and that trials of a gateway communications node have been undertaken involving the F-35 and Typhoon. (Paragraph 46)**

The Government continuously seeks to improve the inter-operability between defence and security systems across the air, land, sea and cyber domains in order to gain the optimum effectiveness and efficiency from our assets. Enhancing the ability for F-35 to share data covertly across the battlespace, thereby increasing its potency, is a prime example of this principle. The Department will continue to determine the optimum means to enable effective and secure information exchange (noting that MADL is just one solution to meet this requirement).

**2. We agree with Justin Bronk from RUSI that, without an advanced data link and translation node, the UK will be underusing one of the key capabilities of the F-35—its ability to interact with older aircraft and greatly augment their potency. In the light of**

1 Defence Committee HC 326 (2017), Unclear for take-off? F-35 Procurement, pages 7–8.

2 HM Government (2015), National Security Strategy and Strategic Defence and Security Review 2015: A Secure and Prosperous United Kingdom, page 31.

*the successful Babel Fish III trial, which saw a gateway node used to translate MADL messages to Link 16 format between F-35s and Typhoons, earlier this year, and ahead of the UK receiving its first squadron of F-35 fighters next year, we recommend that the MoD make provision for the procurement of a gateway translation node for MADL-based F-35 to Typhoon communication in the next Equipment Plan. (Paragraph 47)*

The MoD has undertaken a series of trials of communication nodes between the Link 16 format and the MADL format using F-35 and Typhoon aircraft. However, in order to make an informed investment choice of acquiring and fitting such systems more widely, we must first understand the value to each potential user in receiving any such data (especially when most of the contained information is relevant only to F-35 systems) and importantly whether likely operational circumstances permit exchange of such data (operating range, altitudes, environmental conditions, etc.).

The MoD, alongside the US Services and industry partners will continue to explore the value of exchanging data through the classified series of Babel Fish trials. These trials will enable the MoD to set specific requirements for a communication node (or potentially modification to Typhoon) to enhance F-35 data sharing. This will form the basis of a cost/benefit analysis for consideration in the MoD's annual investment planning process.

**3. If the potential benefits of the F-35 to the UK's future carrier strike capabilities are to be realised then the Queen Elizabeth carriers will require a broadband capacity beyond 8 megabits. While we note that the MoD claims that there is scope for the current bandwidth to be enlarged, it seems highly likely that a capacity in excess of the 32 megabits currently available on the USS America will be required for an effective carrier strike capability. (Paragraph 57)**

The planned bandwidth of the Queen Elizabeth Class (QEC) aircraft carriers meets the current requirements and is being scaled to meet the needs of a Maritime Task Group in the next decade. There are no operational constraints resulting from QEC carriers' connectivity. Direct comparisons with US communications systems are not entirely valid: UK networks are set up differently and include both satellite and radio communications systems. As with all programmes, requirements and opportunities are kept under constant review and will be developed through the life of our platforms. The aircraft, the carrier and her escorts make constant demands upon our communication networks, which are all designed with capacity to grow.

**4. The F-35 probably relies more on software than any other defence programme in history and ALIS is of particular importance. This software plays a key role in the day-to-day operation and management of the F-35 and it is unsurprising, then, that concerns have been raised about potential vulnerability to hacking. We were, therefore, glad to hear from Lockheed Martin and the MoD that there has been rigorous cyber-testing of ALIS and that software bugs have mostly been rectified. (Paragraph 71)**

The Department notes the importance that the Committee places on this issue, and concurs. The Autonomic Logistics Information System (ALIS) is an important system for F-35 and it has been, and will continue to be, subject to rigorous cyber-testing.

**5. We are aware that concerns were raised about the intellectual property rights of ALIS and the potential implications for the MoD's long-term management of the UK's**

**F-35 fleet. While we were pleased that Lockheed Martin confirmed in oral evidence that the UK will have complete and unfettered use of ALIS and its technical data for the sovereign operation of our fleet, we note that Lockheed Martin's supplementary evidence weakened this guarantee by claiming that the US Government had an 'unlimited rights license' for this software, including the right to distribute technical data to other nations and to industry competitors. We ask that Lockheed Martin provide clarity on the level of protection in place for the technical data gathered by ALIS software concerning UK F-35s—including whether this data falls within the US Government's 'unlimited rights license'. (Paragraph 72)**

The US Government, through the F-35 Joint Programme Office (JPO), is the contracting authority for the F-35 programme and has secured rights to the ALIS software on behalf of the F-35 programme. It does not give the F-35 JPO or the US Government rights to partner nations' sovereign data that is entered onto the ALIS system. A partner nation's sovereign data is not shared with other partner nations, including the US.

**6. The Committee views the MoD's failure to provide adequate cost estimates, either on an overall programme basis or on a per-aircraft basis, as wholly unsatisfactory. It amounts to an open-ended financial commitment which can be quantified only in retrospect. (Paragraph 92)**

The Government has provided a 10-year budget for the UK F-35 programme, a cost estimate which includes support costs for all 48 aircraft out to 2048, and provided per aircraft prices where commercially possible.

In SDSR 15, the Government committed to maintaining its plan to buy 138 F-35 Lightning aircraft over the life of the programme. This policy commitment is vital to demonstrate UK support to the bilateral and multilateral memoranda of understanding<sup>3</sup> that are the foundation of the international F-35 partnership. This commitment secured early influence in the design of the air system and significant UK industrial workshare. All nine partners have made similar policy commitments with a programme of record of intended total aircraft procurement,<sup>4</sup> with the UK the largest non-US partner. This policy commitment is not an open-ended financial commitment, as only the first 48 F-35s are contractually committed to and budgeted for in the MoD's 10-year Equipment Plan. The UK Government retains choice in the F-35 programme going forward; the timing of investment and choice of variant of the remaining 90 F-35s has not yet been determined. When the Government makes this decision, the UK F-35 programme will be expanded to include the uplift, and this will be reflected in our routine governance and reporting processes.

**7. We understand that the Lot-by-Lot procurement process for the aircraft, allied with the separate processes for procuring parts and spares and logistical support, make it difficult to calculate the total cost whether on a per-aircraft or on a programme as-a-whole basis. However, it is simply not acceptable for the Ministry of Defence to refuse to disclose to Parliament and the public its estimates for the total cost of the**

3 Joint Strike Fighter (JSF) Programme System Design and Demonstration Memorandum of Understanding (MoU) 2001 and JSF Programme Production, Sustainment and Follow-on Development MoU 2006.

4 USA: 2456, UK: 138, Australia: 100, Turkey: 100, Italy: 90, Canada: 65, Norway: 52, Netherlands: 37, Denmark: 27.

**programme, and to suggest instead that we must wait until the mid-2030s (when all 138 F-35 have been procured) to be able to work out a full unit cost for each aircraft, once spares and upgrades are included. (Paragraph 93)**

The Government has publicly disclosed the cost estimate for the procurement of the first 48 F-35 aircraft and their support costs out to 2048 as circa £13 billion. Of this cost, £9.1 billion has so far been approved to cover support to 2020 and delivery of 48 aircraft, with the last of these being delivered in 2024. This is the totality of the UK F-35 procurement programme as specified in the MoD's 10-year Equipment Plan. As the timing, variant choice and budget for the remaining 90 aircraft has yet to be determined, they are not currently included in the programme. The Department maintains the position that creating speculative estimates outside the official UK F-35 procurement programme would prove to be inaccurate and misleading, given that we are looking up to 50 years into the future. Such estimates could potentially compromise the position of the Government, the taxpayer and international partners in any future contractual negotiation.

**8. The lack of transparency over the costs of the F-35 is unacceptable and risks undermining public confidence in the programme. The Department should provide us with the 'rough orders of magnitude' it claims to possess for the total costs of the F-35 programme beyond 2026/7. (Paragraph 94)**

The UK F-35 programme, which is the procurement of 48 F-35Bs and their support to 2048 only, remains on track, on time and within budget to deliver a world-class capability to our Armed Forces. The MoD has disclosed both the 10-year approved budget, and the total cost estimate out to 2048 for the overall UK F-35 programme as circa £13 billion.

The Government strongly refutes any suggestion that there is a lack of transparency in the F-35 programme, with intense scrutiny ranging from this inquiry and those of the Public Accounts Committee, to investigations from the UK's independent public spending watchdog,<sup>5</sup> as well as the information we regularly publish ourselves in the Government Major Programmes Portfolio. The JPO, as lead element for the International F-35 Programme, is reviewed annually by the US Government Accountability Office, which is similar to the UK's National Audit Office (NAO), and receives an annual Director of Operational Test and Evaluation (O&TE) report on the status of the programme. All of this data is made available to the UK and underpins our additional scrutiny activities.

## General observations

**9. In July 2017, The Times conducted an investigation into the F-35 programme. This investigation resulted in a number of serious allegations being levelled at the most expensive international defence programme in history—the linch-pin of our future carrier strike capability. Our short inquiry has sought to weigh the claims made by The Times against expert commentary, technical reports and the evidence of Lockheed Martin and the Ministry of Defence. (Paragraph 115)**

Whilst we wish to express our disappointment that *The Times* did not consider our explanation of their concerns before they published, we nevertheless welcome the interest that both *The Times* and the Committee have shown in this complex and vitally important capability for the UK.

5 National Audit Office, "Delivering Carrier Strike" dated March 2017.

**10. The F-35 has clearly experienced a number of software and hardware problems during its development phase, and it is important to acknowledge that it would have been unusual for a project of the size, scale and technological complexity of the F-35 not to encounter any during its design and development process. Nevertheless, *The Times's* investigation has provided cause for concern. (Paragraph 116)**

It is precisely because of the size, scale and technological complexity of the F-35 programme that the UK took the decision to invest in 2001 as a Level 1 partner. That early foresight is now bearing fruit in terms of access to information and industrial workshare. There is no better way to fully understand a capability, its potency and its limitations, than to be part of the design and testing of that capability. As the only partner to the US in the System Design and Demonstration (SDD) phase of the programme, the UK works with the US to identify and address technical issues as they arise, ensuring that the Air System meets the contract specification.

**11. Such concern has not been alleviated by the Department's and Lockheed Martin's initial response to the issues raised by *The Times*. The F-35 is set to be one of the biggest defence investments ever made by a UK Government and a programme that supports thousands of British manufacturing jobs. The newspaper's investigation provided the Government and Lockheed Martin with an opportunity to reassure the public and build support for a vital defence project. It is disappointing that neither invested in a serious media and public relations effort to refute the claims made by *The Times*, relying instead on a letter to the editor of the paper (in the case of Lockheed Martin) and a rather dismissive letter and briefing circulated by the Government to Conservative MPs. (Paragraph 117)**

The committee's concern is noted. The MoD's Directorate of Defence Communications (DDC) always works promptly and responsibly to rebut any negative news coverage. When *The Times* approached the Department about their investigation, DDC issued a spokesperson statement clearly assuring the outlet that the Lightning programme was on time, within costs and offered the best capability for our Armed Forces. DDC also rebutted every single claim made by *The Times* with a specific response in advance of their publication. This was then used to proactively offset further coverage and this position, as well as a positive statement from Wing Commander Jim Beck, was publicised in DDC's daily Defence in the Media blog on the day of the coverage.

DDC also has a proactive communications plan in place for the Lightning programme based on significant events and milestones. The plan outlines opportunities for regular messaging around the development of aircraft build, through to trials, training and UK basing. Last year DDC promoted the programme in a range of ways, including supporting a variety of media briefing facilities with Lightning pilots, arranging numerous national interviews with Lightning pilots and promoting milestones ranging from the delivery of the UK's 14th jet to the aircraft being cleared to take off from HMS Queen Elizabeth.

**12. We were surprised, given the cross-party nature of defence issues, that the letter from Harriett Baldwin and accompanying briefing document were sent by the Government only to Members on its own side. In future, where the Government is responding to claims made in public about defence projects, it should ensure that both sides of the House, rather than just Members on its own side, are kept informed. In**

**this instance, the Government, as a matter of course, should have sent the letter and briefing to the Defence Committee and deposited the documents in the Library of the House of Commons. (Paragraph 118)**

The Government acknowledges that sending the letter from Harriett Baldwin MP, the then Minister for Defence Procurement, only to Members on the Government's side was a regrettable oversight. In future, the Department will ensure that any such letters are distributed to all Members and that any relevant documentation is laid in the Library of the House.

**13. We have received a number of assurances from the Government and Lockheed Martin that problems identified in *The Times's* investigation and the report of the DOT&E have been, or are in the process of being, tackled. For the time being, we are willing to accept the assurances that have been given by Lockheed Martin and the MoD. Nevertheless, we will continue to pay close attention to the delivery of this programme and will hold both Lockheed Martin and the Government to each of the assurances made during the course of our inquiry. (Paragraph 119)**

The Government welcomes the interest that the Committee has shown in this complex and vitally important capability for the UK. Any new capability faces challenges and issues that need to be overcome and the F-35 is no exception. The Committee should be reassured that the programme has a robust system, in which the UK has an equal vote to the US Services, for dealing with these issues and all stakeholders are committed to ensure that the UK receives the best capability and best value for money to the UK taxpayer.

**14. The F-35 could be a transformative capability for the UK and our allies. It is the duty of Lockheed Martin, the MoD and the Joint Programme Office to ensure this potential is realised. *The MoD should, therefore, agree to provide this Committee with six-monthly updates on the F-35 programme. These updates must detail the progress made in addressing each of the issues identified in this report and any additional problems. These updates should also include details of the ongoing cost of the programme, including on sustainment, spares and logistics, software upgrades and the unit recurring flyaway costs. Furthermore, following any future trials of communications between F-35s and older aircraft, via MADL systems, such as Babel Fish III, the MoD should produce a memorandum informing the Committee of the progress made.* (Paragraph 120)**

We would be content to provide six-monthly updates to the Committee, within the constraints of classification and commercial sensitivity, and aligned to our current mandated reporting of the approved programme.

**15. The F-35 is a major investment in defence capability for the UK. We want it to succeed and to become the cornerstone of a new and effective carrier strike capability for this country. However, it is precisely because of the significance of this project that it must be subjected to the closest possible scrutiny, so that the public can have confidence in its affordability and deliverability. We thank *The Times* for its investigation and for focusing attention upon the procurement of this vital military capability. (Paragraph 121)**

As the second largest programme in Defence, the Government welcomes the scrutiny placed by this Committee, and others, on the F-35 Programme. It is entirely appropriate given the level of investment and the importance of the F-35 to both the combat air power



and carrier strike capability for this country. However, we wish to assure the Committee that the level of scrutiny applied to this programme is consistent with its importance to Defence and the UK.

The F-35 Programme, both in the US and UK, provides data to support a number of significant, high granularity, reports both internally and externally. As part of the Government Major Projects Portfolio (GMPP), information is fed externally via the annual Project Performance Summary Table (formerly the Major Projects Report). In addition, F-35 has been subject to National Audit Office published reports as part of their scrutiny of the Delivery of Carrier Strike and the Defence Equipment Plan. Significant programme developments will continue to be contained within these reports. The programme also has undertaken engagement activities, such as the F-35 demonstrator event held at the Institute of Engineering on 16–17 January 2018, to provide an opportunity for increased transparency and demystify some elements of the programme within security constraints.

Internally, the F-35 programme has a robust governance process where programme risks and issues are tracked and managed both in the US JPO and UK. Service-led scrutiny is conducted through six senior-level change management, holding to account and Governance boards that convene on a frequent basis. It is held to account by the Infrastructure and Projects Authority, which provides independent assurance reporting through the Cabinet Office and HMT, as well as Integrated Assurance Reviews, the most recent of which took place in November 2017. In addition to this, it is also subject to scrutiny via the Director of OT&E report, as part of the global F-35 programme, the most recent of which was published on 25 January 2018.

*16 February 2018*

## Appendix 2: Lockheed Martin Response

In its report, *Unclear for take-off? F-35 Procurement* (HC 326, 19 December 2017), the Defence Select Committee asked Lockheed Martin to “provide clarity on the level of protection in place for the technical data gathered by ALIS software concerning UK F-35s—including whether this data falls within the US Government’s ‘unlimited rights licence’”.

The Autonomic Logistics Information System (ALIS) supports every aspect of F-35 aircraft operations and sustainment. Under US Department of Defense Federal Acquisition Regulations (DFARS), Lockheed Martin is required to ensure that all customers have complete and unfettered use of ALIS for the sovereign use of their aircraft, including operations, maintenance, installation and training.

As F-35 operators use their aircraft, certain types of data are collated through ALIS. This data is used to analyse trends and optimise the global F-35 sustainment network, which supports and is used by all F-35 operators including the United Kingdom. Any collected data is protected in compliance with contractual requirements and export control regimes. Examples of the data and how it is used are illustrated in the following table:

Data Type	Data Usage
Reliability and maintenance	Trend analysis
Flight hours and aircraft manoeuvre history	Aircraft service life evaluation
Configuration management	Time compliance technical directive updates
Prognostic Health Data	Reliability and maintainability trends
Engine usage	Time sensitive part replacement
Parts ordering data	Spares replenishment
Request for technical assistance	Anomaly resolution

ALIS incorporates controls which allow operating countries to manage how this information is shared.

The data generated during the use of F-35 aircraft is separate from Lockheed Martin’s Intellectual Property (IP) which was incorporated into the design of ALIS. The US Government’s ‘unlimited rights licence’ applies to Lockheed Martin technical data that is a contract deliverable. UK data is not a contract deliverable and is not subject to an unlimited rights licence. Lockheed Martin’s written submission to the Defence Select Committee, which referred to ALIS IP as ‘technical data’, could have been clearer on this point.

I hope this provides clarity and reassurance to the Committee.

Yours sincerely,

Peter Ruddock

2 February 2018