

Defence Committee

Oral evidence: Aviation Procurement, HC 178

Wednesday 22 March 2023

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Members present: Mr Tobias Ellwood (Chair); Robert Courts; Dave Doogan; Mr Kevan Jones; Mrs Emma Lewell-Buck; Gavin Robinson; John Spellar; Derek Twigg.

Questions 225-300

Witnesses

[I](#): Squadron Leader (ret'd) Andy Netherwood.

[II](#): Captain Royal Navy (ret'd) Dan Stembridge, Chair, Air & Space Power Group, Royal Aeronautical Society, and Lieutenant General USAF (ret'd) David Deptula, Dean, Mitchell Institute for Aerospace Studies.

Examination of witness

Witness: Andy Netherwood.

Chair: Good morning. This is the Defence Committee and we are going to continue our study on aviation procurement. Our hearing is divided into two halves. The first half hour will focus on the C-17, but more importantly the Hercules. I am delighted to welcome Andy Netherwood, who is a former squadron leader. He flew the C-17 and indeed the Hercules, and he has huge experience in Op TELIC and Op HERRICK.

Mr Netherwood, thank you very much for your time this morning. We are really interested to learn about the Hercules, its impact and how it has been used in our MoD. Most concerningly, because it was decided in the last integrated review, or the Command Paper, that this entire programme was going to be cut, we are really keen to learn from you about its contribution and whether we should be continuing the platform. I invite Gavin Robinson to kick us off.

Q225 **Gavin Robinson:** Good morning, Mr Netherwood. What is the purpose and function of the air mobility fleet? What impact will the capability cuts announced in the 2021 Defence Command Paper have on the overall ability of the UK's air mobility force to fulfil its role?

Andy Netherwood: The air mobility force provides fixed-wing air mobility to primarily the Ministry of Defence, but other Government Departments as well. Air mobility is the ability to deploy, sustain and recover personnel and equipment, often over a significant distance. The C-130 has been an important component of the UK air mobility force for many years, providing 14 aircraft that were to be retained until the early 2030s. As you know, that decision was changed in the 2015 Defence Command Paper, and they decided to retire it early this year.

On the impact that will have on the air mobility force, it is helpful to divide that into capability and capacity. In terms of capability, again it is helpful to divide that into two. The first capability loss will be temporary. This refers to the gap between the C-130 being retired and certain niche capabilities being transferred across to the A400M. I have read the evidence from the Chief of the Air Staff and Air Marshal Martin, and I understand that will be complete by 2025. So we are looking at a two-year, or a year-and-a-half gap in some niche capabilities. Some capability loss will be permanent. Having an aircraft that is capable of carrying between 10 and 37 tonnes of cargo, and an aircraft that get into the smallest airfields—something a bit smaller and more discreet than a larger aircraft such as an A400 or a C-17—is very important.

Turning to capacity, on the tactical air mobility side, the loss of the C-130 will result in an approximately one-third cut in the number of tactical air mobility task lines. It is a significant cut in the overall airlift capacity that is available to UK Defence and other Government Departments. That will be enduring, although it will be slightly mitigated if the plan to buy an additional six A400s towards the end of this decade goes ahead.



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Q226 Gavin Robinson: You mentioned the temporary loss of some niche capabilities. For the benefit of the Committee, would you mind indicating what those niche capabilities are?

Andy Netherwood: I only have sight of the capability transfer road map, so I don't know which capabilities haven't yet been transferred in full to A400 and what that transfer map looks like. The MoD hasn't released that information because it is associated with support for special forces. It is not something that they disclose.

Q227 Chair: Maybe I can probe that a bit further. You seem to suggest that you might know what they are, but you are not necessarily familiar with whether they have been fully transferred across. Are you able to share what the niche capabilities are that needed to be transferred across, or do you—

Andy Netherwood: I don't know which capabilities have been transferred across and which ones haven't because I am a civilian now and I'm not sighted on that information, unless the MoD puts it into the public domain, which they haven't.

Q228 Chair: If I were to suggest that one of them might be single chalk or multiple chalk sorties, would that potentially be one of them?

Andy Netherwood: I think you are talking about low-level parachuting, which is more of a green Army support capability, rather than special forces. They haven't got twin stick parachuting capability certified yet. I think they are expecting that at the end of the year. For 2025—sort of later on—these are the more esoteric SF support capabilities, which is why I don't know what they are. The MoD hasn't said publicly what they are.

Q229 Chair: We might as well pursue that for a second. I understand from the French, who are going through something similar with the A400, that they had a series of injuries when they did twin stick sorties with parachutists disembarking, I think on both sides of the aircraft, then colliding under the belly of the aircraft as they jumped out. That is a huge concern, isn't it? But you described that more as green Army than SF. Nevertheless, it is one of those skill sets that needs to be transferred across.

Andy Netherwood: Yes, absolutely. It is a capability that is required, along with the SF capabilities, which are less to do with low-level parachuting—you know, that kind of static line low-level parachuting—and more to do with other, kind of stores delivery-type tasks.

Q230 Chair: Okay. Would another capability be, for example, the ability to land on a very short runway, or a bumpy dirt track of a runway, which Hercules can do with ease, and take off, versus the A400, which of course is a lot larger aircraft built to do those sorts of thing?

Andy Netherwood: Yes. Both A400 and C-130 are capable of landing on short, austere strips. I understand that the Committee has been trying to drag out of Airbus and Lockheed which aircraft type can land on the shortest strips. The issue is that calculating aircraft performance depends



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on a whole bunch of parameters. That makes it easy to adjust those parameters to get the answer that you're looking for. I have looked at the Airbus figures, which demonstrate that if you're operating at max C-130 range and with higher payloads, then A400 can operate on the shorter strip. If you're looking at larger load sizes, whether that load is cargo, fuel or both, then yes, that is going to favour the A400. It is a larger aircraft, so it is more efficient at larger payload and fuel weights.

If you wanted to get into a really small strip, the commander would be choosing a C-130. You can mitigate the range issue in other ways. If you had tiny strip and the C-130 could only get in taking a fairly small amount of fuel out, you could mitigate that either by prepositioning to an airfield closer to where you were going or using air-to-air refuelling. If the strip is too small for an A400, it is too small. You can't get in. It is as simple as that.

The other issue with operating with small airfields is that airfields with small runways tend to have small aircraft handling platforms as well—small taxiways and small ramps—so you want a smaller aircraft, because otherwise you will find that you will not have room for all the other surfaces. It is not just about the runway.

Q231 Chair: You mentioned the 14 aircraft. Were they all due to retire in 2030? Or was that the date that was had in mind, and they are being retired far earlier? Does that apply to the whole fleet?

Andy Netherwood: The Defence Command Paper said the 2030s. Typically, when you retire an aircraft, it would be staggered. Aircraft have to undergo periodic servicing, and that servicing is staggered so that you do not have all the fleet being maintained at the same time. So you would retire an aircraft when it has run out of hours after its last routine servicing, and that produces a stagger. In fact, that is what we have seen already with the C-130. I understand that the first four have already gone, because they have run out of hours since their last periodic servicing, and it is not worth paying for another routine servicing on an aircraft that is about to retire.

Q232 Chair: Do you know what has happened to those four? Have they been scrapped, or sold on for somebody else to do that servicing so they can get some more life out of them? You may not know.

Andy Netherwood: The procedure is that they will be handed over to the defence disposal agency, which will sell them if it can or, if it cannot, scrap them.

Q233 Dave Doogan: There is a really important distinction, Andy. You are saying that they are life ex in terms of their service life, not their fatigue life. The RAF is declining to put them through an expensive service to get their service hours reset. It is not the air frames that are life ex, which would deem them to be scrap.

Andy Netherwood: If they are life ex because the air frame has run out of fatigue life, I would be really interested to know what happened

between 2015 and now, because the intent in 2015 was for these aircraft to run until the 2030s, and the RAF said that they were capable of running to the 2030s.

Chair: That is a very interesting point.

Q234 **Robert Courts:** Good morning, Mr Netherwood; thank you for coming along. Can I pick up the last point? You may have just given the answer to that. There was a wing spar replacement that has kept them lifed to the 2035 period, wasn't there?

Andy Netherwood: Yes.

Robert Courts: You may have just said that while I was—

Andy Netherwood: Yes, when the decision was taken to retire them in the 2030s, they went through £120 million wing box replacement and anti-obsolescence programme.

Q235 **Robert Courts:** So, on the face of it, they should be capable of operating till that time, subject to that fatigue point, which would be unusual.

Andy Netherwood: Yes. In 2015, the plan was to operate them until the 2030s, so if they are now not capable of operating until the 2030s, I would be really interested to understand why.

Q236 **Robert Courts:** I am going to go into some of the detail on the task lines, the mass point, the availability point, and the capability point, but before we do that, I would like to take a look at some of your comments around what the air mobility force does and its importance to UK Defence. You have said that it is important to UK Defence and to other Government Departments. I would like to unpack that, so that we have a clear understanding of how important it is. If I were to characterise it as taking arms to Ukraine, disaster relief, moving UK troops abroad and everything in between, would that be accurate? What gaps would you fill in?

Andy Netherwood: Absolutely. The biggest Government Department that uses RAF air transport, besides the Ministry of Defence, is the Foreign, Commonwealth and Development Office. We saw that with RAF air mobility aircraft being at the very forefront of humanitarian and disaster relief operations. But I would also add in the Department of Health. We particularly saw, during the covid pandemic, how important air mobility was in the early stages—moving central personnel and patients around the UK—and then, latterly, flying vaccines around as well. Foreign, Commonwealth and Development Office and Department of Health—that is all important. Our air mobility is a really important instrument of soft power and defence engagement, and not only with the humanitarian and disaster relief stuff. You can also put air mobility aircraft into places where you would not necessarily be able to put combat aircraft because they have this kind of dual purpose—they are not necessarily warlike. That is hugely important. It runs through every thread of what the integrated review said it wanted Britain to do in terms of global ambition.

Q237 **Robert Courts:** Would it be fair to say that the air mobility force and



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what it does is central to everything that the UK wishes to do in defence and diplomacy, and is consequently one of the most highly tasked areas of defence?

Andy Netherwood: Yes, that would be absolutely fair.

Q238 **Robert Courts:** I want to look at some of the specifics. I am going to talk first of all about the mass point before we go to the specifics of capability. We have been talking about task lines; of course, some people will understand what that is, but it might be helpful if, just for good order, we explain what a task line is and what it means when used in the context of air mobility.

Andy Netherwood: A task line is a discrete task that is made up of an aircraft and crew that is capable of carrying a load from A to B. The reason why the distinction is important is that there is a tendency to take a sort of spreadsheet approach and look at the total cargo tonnage that the RAF air mobility force can take as a whole, and, because the A400 can carry more than a C-130, it hasn't necessarily gone down in terms of total tonnage, but that is irrelevant if those tonnages aren't always going to the same place. You need discrete task lines—one going somewhere, some going somewhere else.

The other point is that even where everything is going to the same place, frequency is important as well. It is not just a case of needing x hundred tonnes of cargo and passengers going from A to B; you need to be going there frequently, as well. If you are on the frontline and waiting for a critical spare part, you need that frequency of air transport. Similarly, if you are a soldier waiting on your roulement in place or your R and R, you don't necessarily want to be waiting two weeks, with the cargo going in huge great lumps rather than little and often.

Q239 **Robert Courts:** So, if I understand it right, it may be that the A400 can carry more, faster and further, which is all very well, but it can't be in two places at once, and it can't go to two separate places at the same time.

Andy Netherwood: Absolutely.

Q240 **Robert Courts:** Okay. What does that mean in practice, then? If the number of task lines is going to be reduced as a result of the loss of C-130, what does that mean in practice for the Air Force's output?

Andy Netherwood: Because of the way that air transport is prioritised, and it has to be prioritised—I have heard air mobility described as crack, because you can never satisfy the demand; demand will always outstrip supply—the commander will come up with a prioritised list where they will rank all the requirements for air mobility. It is all put on the prioritised list, and the line is drawn across the point at which you run out of task lines. The short answer to "What will be lost?" is anything underneath that line, which will depend on the commander's priorities at the time.

Q241 **Robert Courts:** Inevitably, there will be a trade-off and there will be compromises. From your experience, do you know what those might be? I appreciate that it will depend on the commander at the time and the



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circumstances, but are you able to assist us with what those likely deprioritisations might be?

Andy Netherwood: I have sat as a member of the committee that has divvied out air transport and drawn that line. Historically, it has tended to be training—both collective training, in terms of air mobility support for exercises and participating in UK exercises, but also whenever defence needs to exercise overseas, that requires air mobility support and, if there isn't enough air mobility support, the exercise is either curbed or cancelled.

Q242 **Robert Courts:** Can I pause you at that point? I want you to hold the thought you are about to go on to, as I want to look at that because of the importance of training. I am conscious of the RUSI report that has just come out about rebuilding the credibility of European air defences in light of the lessons learnt in Ukraine. I think it is a Justin Bronk paper. One of the points that it makes is about the centrality of training, and the fact that while there are a number of factors around the Russian air force's lack of performance, training is a big part of it. Given the centrality of everything air mobility does to deliver defence in wider terms, does this have an impact? If one of the things that is going to be cut is training, that is obviously going to have an impact on the air crews and the people in air mobility, but does it have a knock-on effect on the wider output of UK defence?

Andy Netherwood: The main knock-on effect is on wider defence. Most sorties that the air mobility force flies are for somebody else. A tiny proportion is training, especially with so much training being done in a simulator and synthetically now. The impact will be on other people's training, because the air mobility force cannot support their exercises as well as individual training with, for example, parachuting. Most parachuting training now is done by civilian-contracted aircraft because they are smaller, cheaper and lighter. You don't want a soldier to jump out of the aircraft they are going to jump out of for real for the first time when it is actually for real. Those are the sorts of things that get cut.

Historically, training has taken the biggest hit when there has not been enough airlift to go around. But it is whatever Defence decides are those low-priority tasks. In wartime, for example during HERRICK, when we had a fairly fragile air bridge, the kinds of things that ended up suffering as a result were things like roulement in place and R&R. I am aware that there are some soldiers on the Committee, and I am sure they will be very familiar with what happens when there is not enough air transport to go around.

Q243 **Robert Courts:** Can you put that on the record for us?

Andy Netherwood: If there is not enough air transport, it reduces command's options. Every operation will need air mobility in some form, and if there is not enough to go around, that will curtail the command's options.

Q244 **Robert Courts:** Let us just look at some of the numbers around the task



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lines. When the Chief of the Air Staff was here, I put a point to him that came out of a written answer that had been given about a year ago. With the caveat that a bit of time has elapsed, at the time of the answer the A400M was doing about 1,500 task lines, with the J doing 1,800 task lines. The BAe 146 task lines had gone, for the small freight. The A400 is expected to pick up all of the C-130J's 1,800 task lines, plus the 146's. I put it to him that that just was not going to be enough. Do you have any comment on the availability of task lines? Simply, is there going to be enough, given that the A400 is picking up all the J plus the 146?

Andy Netherwood: There will be a shortfall in airlift. I read the transcripts of when you were questioning the chief on that, and he accepted that there would be a shortage of airlift.

Q245 **Robert Courts:** That is likely to mean we are going to be relying on allies to backfill it, isn't it?

Andy Netherwood: Unfortunately, our allies, apart from the Americans, are also short of airlift. One of the shortcomings that has been identified across all European air forces is a shortage of airlift, so relying on allies would be problematic. Some of it can be put out to civilian charter. That makes an important contribution. Of course, civilian charter costs money, so you are already eroding some of the savings you have made by deleting the C-130 in the first place. In war, there is a limit to what you can do with civilian charter as opposed to military air transport.

Q246 **Robert Courts:** Could we look at some comparative examples? You have mentioned European allies, and I think it is important to distinguish whenever you can between strategic and tactical airlift. The French, as I understand it, will have 50 A400s, plus 14 C-130s, so they are operating A400 and C-130 together. Now, they don't have C-17, so they are using A400 in a strategic lift role, I would anticipate. It looks, doesn't it, as if we are already below their capability?

Andy Netherwood: Yes. If you look across other European air forces, they recognise this shortage of airlift, so they are investing in it, while the RAF, compared with 2015, is disinvesting in it.

Q247 **Robert Courts:** Could you just unpack that a little bit, please? In what way are they investing in it? It might be helpful if you distinguish between strategic and tactical airlift in your answer.

Andy Netherwood: You mention the French—it is a sort of Franco-German C-130 squadron that they are setting up, because they recognise the need for smaller aircraft than the A400 to do some of their special forces stuff. In terms of strategic, that is where European air forces are short, and that is why we have seen initiatives such as the strategic airlift consortium operating C-17s out of Hungary to try to resolve that gap in airlift.

Q248 **Robert Courts:** Could you just give us a bit more detail on how they are investing, at the same time as we are not?



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Andy Netherwood: I am not sure what I can add to what I have already said in terms of strategic airlift and the French and Germans buying more C-130s.

Q249 **Robert Courts:** Understood, thank you. I just want to finish off on this point, and then I will talk about the tactical capability. Could extra A400s ameliorate this, were we to see them, or should we simply be reversing the C-130 decision?

Andy Netherwood: In terms of the extra A400s, there are two problems. First, six A400s are not going to pick up the same number of task lines as 14 C-130s. Secondly, there is a bit of a wait for these extra A400s to arrive—if indeed they do arrive, because that is on the other side of the defence review, and we may well see those extra six cut. The six, even if they arrive, will not mitigate the gap at all in the short term, and will only partially mitigate it in the long term.

Q250 **Robert Courts:** Thank you very much. Let's talk about the specific role that the C-130J is performing. You have touched on it in some of the evidence that you have given already. You referred to the specialist role and how some elements cannot be resolved by the A400 because of an unresolvable matter of physics. Could you refer to that in your answer, please? In answering Mr Doogan's question, you also referred to some of the restrictions on the ground capacity. Could you address that as well, please?

Andy Netherwood: Sometimes you just need a smaller aircraft because the airfield you go into is quite small. MOG—the maximum on-ground aircraft—in my experience, is always a huge issue with airlift. You are invariably operating from airfields that are being stretched way in excess of the peacetime capacity that they were designed for, so it really matters how much space you take up on the ramp, and how much runway you need, so sometimes you need a smaller aircraft.

But, sometimes, you need a bigger aircraft. If you have room for an A400, and you have a high volume of cargo that you need to put in there, it makes sense to use an A400 because you are getting more cargo in for, yes, a bigger footprint, but not two C-130s-worth of footprint, so it might make sense to use A400 instead of C-130.

That is my main point, really, in terms of the need to have a variety of aircraft. In the same way, in my written evidence, I used the analogy of a supermarket. Supermarkets operate articulated lorries, and they operate small box vans to do their deliveries. Yes, you can argue that an articulated lorry carries more and is more capable in that respect than a box van, but, if you are operating into a variety of places, some of which are quite tight, then you need the box vans as well. I would carry that across to C-130.

Q251 **Robert Courts:** Might it be the case that there are airfields that are either unable to take A400 because of the ground handling equipment, or cannot take an aircraft of that size because of the sheer number of aircraft on the ground at the same time?



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Andy Netherwood: It is not so much ground handling equipment. A400, like C-17 and like C-130, is designed to operate with an absolute minimum of ground handling equipment, because it is designed for austere airfields. It is just a question of physical space. We are always operating with allies, so it is a negotiation. We saw that with Op Pitting. The Ministry of Defence is having to negotiate with allies over how much ramp space we are going to have, because ramp space becomes the constraint. If the only bit of ramp space you can negotiate with whomever is running the operation is C-130 sized and you only have A400s, you are not going to get in.

Q252 **Robert Courts:** Finally, what tasks and missions could we see affected as a result?

Andy Netherwood: In terms of getting into tiny airfields, the one that springs immediately to mind is special forces, but actually it is anything. Every time we go into a conflict, the airhead is never a well-found, major, Heathrow-size airport; it is always a small regional airport or a small austere strip—so size matters.

Robert Courts: Thank you, Mr Netherwood. There is much more I would like to go through with you, but I am afraid that I am out of time.

Q253 **Dave Doogan:** Mr Netherwood, you can see that there is a fair degree of concern in the Committee about the deletion of C-130 and its capability, with its effect on operations. Should we be even more concerned when we look at the amount of nations—not even peer nations, but any nation—that had C-130 capability and deleted it? That is the club that the United Kingdom has now joined. It includes Angola, the Democratic Republic of the Congo, Spain and Vietnam. There were four nations; with the UK, there will be five. That is testament, among other things, to the capability and value for money of the C-130, is it not?

Andy Netherwood: The C-130 is a fantastic aircraft, as are the A400 and C-17. The point that I would love to finish on, my main point, is that what we are seeing with airlift is the hollowing out of an essential enabler for not just military operations, but operations delivered by many Government Departments in support of global Britain. It is more than the loss of those capabilities for a couple of years; my main concern to share with the Committee is the hollowing out of an essential enabler.

Q254 **Chair:** To bring this to a close and perhaps draw in some of the points that Robert mentioned, the composition of heavy lift has been critical. We have underlined that. There was that interesting mix with the Hercules, the 14, but I think you are saying that we are down to eight now anyway. Is that correct? Twenty A400s and eight C-17s.

Andy Netherwood: In terms of tactical air transport, yes, eight C-17s, 22 A400s when the 22nd is delivered, which is imminently—

Q255 **Chair:** As we have said so often, the world is getting more dangerous, not less. On the air bridge, as it is called, domestically in the UK we are required to move troops, assets and equipment around; we have military interests in Cyprus, the Falklands and Diego Garcia, with well-established



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air bridges there; in the Middle East, we have Al Minhad and Al Musannah, and, in Qatar, Al Udeid, which are three important, strategic airbases that require continual air bridges. Would you agree that by removing the Hercules, we simply won't be able to keep up with the demands that are placed on our heavy lift?

Andy Netherwood: I think we will be able to meet most peacetime demands with the aircraft we have. Inevitably, though, we will hollow out the capability that we will need if we go to war.

Q256 **Chair:** My final point goes back to special forces. Arguably, we have the best in the world. They are respected and revered, and they are one of the assets that the United States particularly enjoys us having and working with. Is there a concern that the delay in approving A400 to replace Hercules, which may not allow all the taskings that the SF do, will mean a reduction in capability—in what the SF can do—if the Hercules is completely removed?

Andy Netherwood: In terms of allies, I would widen that point. I spent three years flying C-17s for the US Air Force on exchange. I can tell you the value that the United States places on allies who are capable of getting their stuff from A to B. Often, other nations contribute forces to US-led operations, but they require the US to deploy, sustain and recover them. One of the things they loved about the UK was that most of the time we can get ourselves from A to B and back again.

Chair: This is one asset that we were hoping that the integrated review refresh might reconsider. Perhaps we will be surprised in the new Command Paper that is expected in June, but we made the case powerfully that this is an important asset. We had it confirmed by the RAF in one of our previous sessions that it is being removed simply because of lack of funds. That is the bottom line, and it is very sad indeed.

Andy Netherwood, thank you very much for your time this morning—it is much appreciated. That brings our first panel to a close. We will take a quick pause to regroup and we will be back in a couple of minutes.

Examination of witnesses

Witnesses: Dan Stembridge and General David Deptula.

Q257 **Chair:** Welcome back to this Defence Committee hearing. I should make it clear, if you are watching live on television, that this is not the Privileges Committee—that is probably on another channel. Nevertheless, we are talking about important things here, as we continue our focus on UK aviation procurement. This is the second part of our session this morning.

I welcome a captain from the Royal Navy, who is now retired, Dan Stembridge. Thank you very much for your time. You have had an incredible career in the armed forces, flying off carriers and so forth. We also welcome Lieutenant General David Deptula of the United States air force, who is beaming in from outside Washington DC. To the pair of you,



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thank you very much indeed. You may have heard the first part of the session that we had before. Maybe I could start with General Deptula on the value of the Hercules aircraft. You probably picked up that we are cutting 14 aircraft here. Could you outline how valuable that is to US air capabilities and maybe give us a hint as to how your SF used them, if you are aware of that?

General Deptula: Air lift is a critical element with respect to enabling air operations, in conducting them across the spectrum of all—not just a military’s, but a nation’s—need, from the capability of providing resupply and support to moving forces, both people and materiel, from one place to another, and also to providing critical support in humanitarian relief and disaster response operations. I would tell you that air lift is one of the critical elements in the United States air force. We talk about the importance of maintaining air and space superiority, conducting global strike and conducting intelligence, surveillance and reconnaissance. Mobility is a critical element, and finally there is command and control. C-130s, both in your military and ours, have played a key role in enabling not just our air forces, but our military writ large to be able to accomplish its missions.

Q258 **Chair:** Thank you. Turning to you, Dan Stembridge, can you explain your view of how Ukraine is perhaps reigniting a focus on the importance of air capability?

Dan Stembridge: Indeed. If I may, just on the C-130 point, it is also the fact that a lot of decisions that have been made in wider UK defence may have been based on the assumption that there is that air mobility available. Decisions on the size of a support pack for a deployed capability would be based on the resupply of that just in time. Of course, if you have reduced the number of lines by the number of lines that we have, that will have an impact that is perhaps not necessarily readily in view when you make that decision. It is the follow-on, knock-on effect.

Q259 **Chair:** General, any thoughts?

General Deptula: In the context of the loss of the C-130s?

Chair: More generally, looking at Ukraine and how the character of conflict has advanced there, but also the concern that NATO, I suppose, is expressing the fact that there is an absence of air capability among NATO countries, which has now been illuminated by what is happening in Ukraine.

General Deptula: Oh my goodness, absolutely yes. First and foremost, combat actions in Ukraine expose the absolute vital importance of air power. Specifically, Ukraine is a stark demonstration of the consequences of not securing air superiority. Air superiority enables the freedom from attack and the freedom to attack. Without it, you see how the Russia-Ukraine conflict has devolved into a war of attrition that resembles the horrors of world war one more than the rapid victory of the first Gulf war in 1991.



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The ability to gain air superiority through a combination of combat aircraft and ground-based air defences is a hallmark of the western way of war. Unlike the 20 years post-9/11 of operating in permissive airspace in Iraq and Afghanistan, control of the air will be a fight in the future. The United Kingdom does have a capability to do that, but the Royal Air Force will need to be constantly updated and augmented through new technology to win that fight. The Royal Air Force at present is too small, with too little depth and too few resources to meet the demands of the growing challenges that it faces.

Specifically, the war in Ukraine has highlighted at least six key gaps in both US and UK air power. No. 1 is a capacity gap in terms of sufficient numbers of combat air forces to meet the needs of our respective defence strategies. The Russian invasion of Ukraine should be a wake-up call to rebuild our respective air forces. No. 2, it has highlighted a readiness gap in levels of realistic training necessary to achieve proficiency and maintain currency to fully exploit the capabilities of our air forces. No. 3, there is a serious munitions gap that has been exposed. During peacetime, there is really no constituency for adequate stocks of either air-to-air missiles or air-to-ground bombs. Munitions accounts are very convenient for raiding funds for higher priority projects during peacetime. The danger is that when war does come, and when the munitions are all consumed, there simply will not be time to produce sufficient numbers to meet demand.

No. 4, there is a corollary to the munitions gap, and that is the gap in sufficient production capacity for both aircraft and munitions. In the entire free world right now, there is only one bomber production line, and it is only producing a handful per year, literally. No. 5 is the importance of logistics. Russia's failure to adequately supply its forces has cost them dearly. The UK and the US need to pay close attention to logistics to avoid the impediments to forces that we are witnessing the Russians experience. No. 6 relates to command and control. Watching events in Ukraine, and the advantages of synchronising multi-domain operations, or operations in every domain—air, sea, land, subsea, space—what is needed to generate an advantage in achieving operationally and strategically significant events becomes obvious. With air power being the most responsive of all lethal effects, I think it is absolutely critical to actualise command and control capabilities for our allied air operations.

Chair: General, there is lots to unpack there. Thank you very much indeed for that. Dave Doogan, would you like to come in on some of the technology that we use?

Q260 **Dave Doogan:** I would like to discuss the E-7 Wedgetail, which the RAF is in the process of procuring. Many of us on this Committee, and in the wider defence environment, are very concerned that the original order for five airframes was a pretty meagre order. That has been cut to three, which Justin Bronk has described as an extremely expensive way of not meeting your commitments. I think that elegantly touches on both the value for money component, which is very challenging, given that the order for five was due to be £2.1 billion and the order for three is £1.9



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billion— there is not much of a financial saving in procurement; there may be in operational costs—and the much more important bit about what operational effect three aircraft will have when you factor in training, maintenance and actual operations, and the subdivision of those assets therein. What would your concern be about not so much the value for money—we can talk all day about that—but the operational efficacy of only having three E-7s in the RAF?

Chair: Dan, do you want to start off with that one?

Dan Stembridge: It is simply not enough. It is not enough to be able to deliver effect in two places at once. It may allow you to join in as part of a coalition and provide, which is an important fact, but fundamentally it is not enough.

Dave Doogan: General Deptula?

General Deptula: I would agree; this is not a prudent reduction. As I mentioned earlier, command and control is one of the most important capabilities in modern air combat, and the E-7 is the most effective and attainable airborne command and control system that will be available in the next decade. While there may be future solutions out there, they are still highly theoretical and high-risk, so if the United Kingdom does not procure its full E-7 fleet now, the aircraft will become harder to acquire in the future and will cost more. Once again, as the captain mentioned, these aircraft are absolutely crucial for the effective functioning of the NATO air enterprise.

Q261 **Dave Doogan:** Given what is happening in Europe right now and the range of priorities that the UK is pursuing in the Euro-Atlantic zone, the Indo-Pacific and other theatres, if it is not three and probably was not five, what do you think a reasonable commitment on E-7s would be, plus or minus one or two?

General Deptula: That is really tough for me to do, and I hesitate to be so presumptuous as to give you a number when you all are much closer to the specific requirements, but I will tell you this, which may help to inform that number. Three aircraft might be able to maintain a single orbit, but what happens when one of those aircraft drops out for some sort of attrition—if it goes down for maintenance or some other reason? The short answer is that you lose your airborne warning picture and command and control. That is a big risk to take. From a big picture perspective, it is a matter of what role the United Kingdom wants to have in ensuring global security and the associated capabilities and capacity necessary to fulfil that role.

Chair: For the record, it took some persuading Boeing to build these three, because it was almost not in their interest to procure them when the number was going down from five to three. There was a lot of discussion, and we ended up paying more for those three, so the savings did not match the effort.

Q262 **Robert Courts:** General, you have given us six lessons, and I want to put



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two others to you for your comment, although you may feel they are subsumed in the six you already gave. The first is more of an issue for us than it is for the US, which is the concentration of all our assets in four main operating bases. Does not the lesson from Ukraine show the vulnerability we have if we are not dispersing our forces and do not have a well worked-out plan to disperse in the event of tension?

The second is about the suppression of enemy air defences. Is it not the case that the west has operated under the assumption that it will have air superiority and the ability to operate more or less at will over a contested battle space, and that if we do not have the ability to remove, suppress or destroy enemy mobile air defences, we will find ourselves in the same position as the Russian air force is finding now over Ukraine?

General Deptula: The short answer to the second question is yes, absolutely. The other point I would like to make with respect to your second question is that the notion that is floating around out there that somehow modern surface-to-air missile systems render aircraft non-effective is nonsense. The reason we put together air campaigns is to be able to come up with a variety of means to suppress enemy air defences and to be able to achieve and operate in airspace, whether it be over enemy or friendly territory.

On your first question, you may be familiar with a concept that the United States air force is embracing, particularly in the Pacific—I spoke with the commander of Pacific air forces on a video webinar on Monday, and he is instituting this there—known as agile combat employment. Not unlike the circumstances that you describe in terms of four main operating bases, there are a handful of major operating bases in the Pacific. Looking at the threats that exist, if those air forces are going to survive, we must become much, much more dispersed. We must at least have plans, in the event that conflict erupts, to distribute our forces and operate in a much more distributed fashion. That would be a prudent set of plans to embrace.

Robert Courts: Thank you very much.

Q263 **John Spellar:** Going back to your six lessons, General, two stood out for me. One was that you talked not about training but about realistic training. Can I tease that out a bit more? There is a very strong direction of travel towards synthetic training, as opposed to actual flying time. Is that the difference that you were trying to draw out?

General Deptula: No, sir, I really wasn't addressing the difference between actual flying time and synthetic training or operational training. I was talking about the importance, once aircrews become operationally qualified, of maintaining realistic training in the context of current and potential threats.

Q264 **John Spellar:** Does that mean simulation or flying?

General Deptula: Well, both. Really, it is going to be a combination of both. If you look at the potential adversaries that we will be facing in the future, there are large numbers of highly sophisticated aircraft that we



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cannot generate at any one time, save for, for example, in Exercise Red Flag. We can supplement the experience by using synthetic training in simulators, but there is nothing that substitutes for actual airborne time and flying against realistic threats.

Q265 **Robert Courts:** Can I just be clear about that? I think what you mean, General, is that it needs to be the level of intensity that you are likely to be facing in a peer or near-peer environment. In other words, it is not doing what we have been doing for 20 years—air policing against next to no air-to-air threat and a minimal surface-to-air threat. Is that what you mean?

General Deptula: Yes, sir, that is correct.

Q266 **John Spellar:** Is there anything that you want to add to that, Dan?

Dan Stembridge: I would agree with everything the General said there. It is both. There are some things that you simply cannot do in live flying, or would not choose to do, in terms of techniques that you might use, and combat systems or tactics that you might not wish to use in live flying. You can only do those in a synthetic environment. There is nothing like putting your pink body into an air system and flying it among a large force exercise. That is training in and of itself. You have to be able to do that, because that is what you are going to have to do on the day of the races.

Q267 **John Spellar:** Can I come on to the point about munitions? You were taking about the level of stockpiles. It is absolutely clear that in all domains, there is a huge problem in the necessary quantities of munitions, and also in the supply chain for replacing them. How do we get the balance right between building up stocks of munitions and maintaining the capability so that we have a scalable capability that can be sped up at much shorter notice than we seem to be able to do at the moment? That is obviously about not just the main suppliers, but their supply chains.

General Deptula: Yes, sir, that is part of the challenge here. It is not just a military problem, because commercial industries produce the necessary munitions. This is just a general example, but it is my understanding that the Ukrainians are currently expending in the order of 6,000 to 7,000 artillery rounds a day, but in the United States we have the ability to produce perhaps 20,000 rounds per month. There is a big gap there, and the order of magnitude of that gap is reflective of not just artillery, but the difference in our ability to produce air-to-air missiles or air-to-ground weapons. This is a fundamental problem that we are facing on both sides of the Atlantic and, I dare say, in most western nations.

Q268 **John Spellar:** What should be done?

General Deptula: Our respective Governments need to motivate industry to build the capacity to produce and provide what you alluded to at the beginning of your remarks: a scalable production capacity. You may not necessarily be pumping out at mass capacity during peacetime all the time, but we need to fill the weapons inventories of our respective militaries to have sufficient weapons on stock to execute a relatively

prolonged conflict. That is No. 1. No. 2 is that we need to have the scalable industrial capacity to rapidly ramp up during times of conflict in order to deliver weapons when they are needed in a timely fashion.

John Spellar: Thank you very much. Dan, do you have anything to add?

Dan Stembridge: I would just say that our stockpiles need to be based on that truth data of how quickly you can ramp up in wartime. Basing it on the idea that we are going to have x amount of weapons, and hoping that we will be able to replenish them when it comes to wartime, is a bet that is not really worth taking.

Q269 **Mrs Lewell-Buck:** Should western nations provide combat air power to Ukraine or not?

Dan Stembridge: I am not really sure that is a fair question. That is a very political question.

Q270 **Mrs Lewell-Buck:** Our Defence Secretary has said that things like training and maintenance personnel might be difficulties. Could we overcome those difficulties?

Dan Stembridge: Could we physically overcome those difficulties? Yes, we could. But is it politically prudent to do so? That is not really my bailiwick.

Q271 **Mrs Lewell-Buck:** The difficulties that the Defence Secretary pointed to are not insurmountable, are they? They could be easily resolvable, couldn't they?

Dan Stembridge: I am not sure they would be easily resolvable, but anything is resolvable if you put enough effort, money and time into it. But it is more about the level of exposure that we wish to have. Of course, the more exposure you have, the more risk you have of miscalculation and then escalating a conflict into a place that you do not necessarily wish to be.

Mrs Lewell-Buck: Thank you. General, do you have any comments?

General Deptula: Yes, thank you very much for the opportunity to answer that question, because if there was ever an example since world war two of a nation fighting against all odds for the freedoms that our own nations regard as fundamental, it is the people of Ukraine. We should support them to the greatest degree possible and rapidly provide them with weapons that will allow them to oust the Russian invaders.

Here's the challenge: in Ukraine's fight against Russian aggression, neither time nor manpower is on Kyiv's side. As the smaller nation—44 million versus Russia's 144 million—Ukraine cannot support a ground war of attrition indefinitely. Putin will win that fight, regardless of how incompetent his military leadership is; it is simple math. Air power is the one asymmetric advantage that can break this stalemate. Appropriate air power of sufficient capability and capacity could fundamentally give Ukraine an advantage over the Russians.



If I may, let me just explain a bit, because sometimes people are confused. Fast jets—fighter aircraft—typically fly at around 600 miles an hour, and they can defend multiple parts of Ukraine on a single mission as a result. Surface forces cannot do that. Manned and unmanned aircraft can carry thousands of pounds of ordnance and employ powerful sensors that report detailed battlefield information in real time. These planes would not only give Ukrainians a new ability to defend against Russian aerial attacks, but also provide counter-offensive capability to destroy the missiles, aircraft, and offensive drones that Russia is launching and put much of Ukraine at risk. Plus, close-air support and interdiction from fighters would also provide a significant advantage to Ukrainian ground forces. Providing Ukraine with the fighter aircraft would allow them to transition from their Soviet-based air force—one that is wearing out today due to attrition and use—to a western-based air force ought to be a priority for NATO.

With respect to the specific question of what western fighters to get to Ukraine, you all know that there are several types out there and available in Europe today. There is the F-16, the F/A-18, the Gripen, the Typhoon and the Mirage 2000 among others. The F-16 is a versatile fighter. More than 4,000 have been built. Contract logistics support exists, and it is readily available in NATO countries. Therefore, I believe that it is the most appropriate option.

With respect to what the United Kingdom can do, backfilling NATO partners with older Typhoons could be an option, but we cannot forget that one of the issues in front of this Committee is that United Kingdom aircraft procurement is already too small, and that the Royal Air Force needs all the aircraft that it has. I offer that RAF Typhoons are not the right fighters for Ukraine. We did talk earlier about those C-130Js that are going to go out of service this summer. You could gift those to Ukraine and establish a joint UK-Ukrainian C-130 squadron to operate from the UK initially and then move in-country to Ukraine when the shooting stops to enable Ukraine to rebuild. Those are a couple of ideas for you.

Mrs Lewell-Buck: Thank you very much.

Q272 **Chair:** Not to put the political pressure on you, Dan, but taking the question back again, can you spell out—I think the general has started to take us there—how critical 2023 will be for Ukraine? They have asked for air power and they have asked for top cover. From your standpoint, why is it so important? Why is President Zelensky coming here, handing over a pilot's helmet and saying, "This is what we need"? From your perspective, is there a window in which air power will make a difference?

Dan Stembridge: The general said it far more eloquently than I ever could. The fact is that it gives you a game-changing capability to be able to deliver that kind of air power across the battlefield and, importantly, going back to what we were talking about with Wedgetail, to be able to do that in a connected environment—to be able to do that in a networked environment where you are able to utilise the capabilities that you have, which, of course, the Russians have not been very good at doing and it is



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partly why they are so stalled where they are at the moment despite their combat mass. Having that sort of capability would certainly be a game changer for them. How you deliver that capability rapidly—because it is not just about providing an air system, but about providing the training for the pilots and the ground crew—you have to have the capacity to be able to do that.

In terms of what that choice of air system might be, I agree with the general. There are thousands of them. There is a well-known training solution to be able to provide that and logistical support to be able to keep them airborne, because that is another important part. You cannot just provide them, but not provide them with the stores and let them just wither on the vine. So, on how we could support, it would be in backfilling and in supporting in other elements.

Q273 Chair: You are absolutely right from an operational perspective. What you say makes sense. You said single platforms—the Leopard tank would perhaps be the obvious one. You saw how, politically, our sliding challenges across the table opened up doors, showed the political courage and others followed. But it is not the right tank for Ukraine. That leaves the question, which has often been debated, about tranche 1 Typhoons. We do have tranche 1 Typhoons. BAE Systems, when we visited them recently, said that it would take a matter of months to train a MiG Ukraine fighter pilot to transfer across, but from your technical experience of the aircraft itself—the tranche 1—can you say what use would it be in air capability over the skies? Is there any ground attack capability, or would it simply be to try to flush away Russian MiGs and air-to-air combat?

Dan Stembridge: Realistically, if you are asking my opinion—you clearly are—it would be the F-16. I wouldn't provide them. It's too small a number that we have and too small a number that we could provide them, and then you would have to have a bespoke training solution—support solution—that is specifically for those air systems. So, for me, I wouldn't look at that as a solution.

Q274 Chair: Yes. But as I say, it is the politically charged aspect of this. As I say, the Challenger tank is probably inappropriate, but perhaps a better method would be to backfill—so, the Typhoons would be to move into a country that has F-16s and they get slid across the table to Ukraine. Would you support that approach?

Dan Stembridge: I mean, it could be done, but again you have got the same problem of a small number of air systems and therefore a bespoke training pipeline for a nation that doesn't operate that air system. So there are complexities to it, but anything can be done, and it depends what message you are trying to send.

Q275 Chair: As Captain Dan Stembridge said, you very eloquently outlined how critical what's going on in Ukraine is for wider European security. From where you are sitting in DC, how come there's a hesitance perhaps to offer the air power that President Zelensky is calling for?



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General Deptula: I will be very candid with you. I believe that Putin's rhetoric is having an effect in deterring western nations from providing the necessary capability to Ukraine to win this war and to eject the Russian forces from Ukraine. However, the fact of the matter is that Putin has demonstrated over and over again that he will make up whatever rationale to escalate or do whatever he wants to do, regardless of how western nations act. So, instead of being deterred by Putin's rhetoric, we need to act to do what's right and what we all know is right, and that is to help Ukraine—

Chair: If I may—

General Deptula: This is the piece; this is the piece that's critical. It's Ukraine that's doing the fighting here. All we're trying to do is to provide them with the tools to allow them to fight.

Q276 **Chair:** Okay. If I may, I think we're all in agreement with that; we understand the seriousness and the gravity of the situation. My question was: politically, why aren't those F-16s being made available to Ukraine from the United States, for example?

General Deptula: Coming from the United States may not be the most rapid way to do this. There are several NATO nations that are getting rid of their F-16s in preparation for accepting F-35s—the Netherlands comes to mind. So, there are a variety of innovative ways to make this happen.

On this subject, I would just leave you with a comment that where there's a will, there's a way; where there is no will, there is no way. Look, the Ukrainians are fighting for their lives; that's another piece here. What you're seeing in terms of a response by some nations is that they're thinking in the context of normal bureaucratic activity. The Ukrainians are fighting for their lives—literally. And it is in the western nations' best interest to provide them with the capability to—

Q277 **Chair:** No, no—we appreciate all that. The question is: if it's in our interests, why politically we are not doing it, and whether or not a nudge by the United States would then allow the Netherlands more confidence to slide their weapon systems across. We've just been accused by Putin—don't forget—of using depleted uranium shells, for example, in the Challenger tanks out there, which is seen as some sort of escalation of the nuclear ladder. Of course that's to be dismissed.

However, if I can make just a final point on this, the mood music that we're picking up here from the Republican party is that they are more and more disinterested in Ukraine, given what Trump has said and what DeSantis said. Would that be a correct interpretation, or do you think there is more to happen between now and when they choose their candidate and their positioning?

General Deptula: I think it is very difficult—look, getting into US politics is not something that I'd like to do, frankly, because what's at stake here is much more important than who might get elected when and the kinds of games that are being played by politicians to garner votes.



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I'll go back to what I said in the beginning of my remarks on this topic and that's that we need to support the Ukrainians in a fashion that will allow them to oust the Russian invaders. Why these leaders are not understanding that is an issue for another day and another set of speakers. Quite frankly, you need to ask them directly that question.

Chair: Well, we try. Let us get back to the focus of today's session.

Q278 **Derek Twigg:** My question is on combat. At a time of limited budgets but increased global instability, how should the balance between combat mass and exquisite but expensive capability be struck? For the UK specifically, what would be the most cost-effective way to address the combat air capability gap in the short term? Should we be purchasing more F-35s, delaying the retirement of tranche 1 Typhoons, or purchasing newer Typhoons to fill the gap until the sixth-generation aircraft enter service towards the end of the next decade?

Dan Stembridge: For me, the answer would be to maintain those that you have, because the mass is not sufficient, and I think the most cost-effective way to bridge the gap until you get towards Tempest would be to buy more F-35Bs.

Q279 **Derek Twigg:** Okay. That is pretty straightforward. General, can I ask your view? Before you answer that, can I ask another question? You said earlier that the RAF is too small and does not have the depth to meet the challenge. I know you are reluctant to get into numbers, but when you say "too small", what sort of size of an air force should a nation of the UK's size and financial ability have? Obviously, that is not in the scale of the US. What was your thinking when you said that before?

General Deptula: Let me offer an analogy and then we can come back to the numbers. The United States Air Force today is the oldest and the smallest in its entire history. I don't know if that is the case with the Royal Air Force, but I do know that it is smaller than it should be, having gone from 36 combat squadrons in Operation Granby to nine today. That is 25% the size that it was in 1991.

Today, the threats that the United Kingdom and the United States and all western nations face are far greater in terms of both capability and capacity. I can't tell you specific numbers, because, first, that would be presumptuous of me. You all understand the demands of your national security strategy specifically, and what might be necessary. What I would tell you is that the current threat environment demands both capability and capacity.

Increasingly, fourth-generation technologies are becoming less and less survivable, so additional investment in new fourth-generation aircraft is an expensive way of getting shot down. Nor are these aircraft necessarily less expensive. In US dollars, a F-35A costs about \$80 million a copy. A new-built fourth-generation aircraft type is actually going for many millions more per copy.



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What you also might consider is what we call cost-for-effect calculus. In other words, how much does it cost from an enterprise vantage point to net your mission results? That has to be entered into the equation here, in terms of what you buy between today and when you get Tempest on board operationally.

If it takes 10 to 20 lower technology aircraft to accomplish a specific mission, at higher risk than in a handful of F-35s, then the net cost is actually much higher than the F-35s. The captain was much more succinct than I have been, but my recommendation would be to buy additional F-35s between now and the time that you bring Tempest on board.

Q280 Derek Twigg: Sorry, but I would just like to press you on that. I understand your reluctance to get into numbers, but it was quite a stark analogy between 1991 and now. Again, I do not want to put words in your mouth, but would you say that the current size of the RAF actually makes it fairly ineffective in what could be a modern-day war?

General Deptula: I would not say that it would be ineffective because I think, to the Royal Air Force's credit, it has built an air force with the numbers that your budgets have allowed them to use. It is very, very effective. The issue is one of quantity, and that is one that is dependent on what the UK Government wants to accomplish in terms of its national security objectives.

Again, the point is that there were 38 RAF combat squadrons back in 1991. Today, there are nine. Let me reverse the question; have threats increased or decreased?

Q281 Derek Twigg: I suppose this is what I was trying to say. I take your point about the force's ability and skill. The technology is effective in that sense but, in terms of any ability to absorb attrition of any sizeable number, it surely would not be effective. Am I right in thinking that?

General Deptula: Yes, that is an additional, complicating issue. Attrition is an issue that we have not really paid a lot of attention to over the last 20 years because we have operated in permissive airspace. I am talking specifically from the air perspective. We have operated in permissive airspace for the 20 years following 9/11. Getting into a dust-up with a peer adversary is going to see attrition on scales that we have not witnessed since World War two.

Q282 Derek Twigg: Okay. Thank you, general. I have a final question for the captain. What might be the implications for a carrier strike, and the purchase of further F-35s, of the ongoing problems with the HMS Prince of Wales?

Dan Stenbridge: The first part to that is over attribution of air systems. The politics of this is, are the F-35s that we have in the UK carrier-borne air systems that are able to operate on land, or are they land-based systems that are able to operate at sea? Fundamentally, we make the choice to not decide. That drives double accounting over what you are using those systems for. We currently have a Navy that force generates a



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maritime taskforce. We have an Air Force that generates air systems, and then we place the responsibility for force generating carrier strike to the Navy, but they do not have the levers to be able to effect that, because they do not own the air systems and they don't own the money and therefore they do not own the capability development or the force generation for it. That creates tension, whether that is intentional or not. It creates tension and it creates question marks over what is enough.

In terms of what is enough from air wing, it depends how big you want the air wing to be and whether you want it to be able to go and do other things. Now, I am not saying that a carrier-based aeroplane should not be used in a land-based conflict, but, if you double accounted for that and you force generate it to that, then you are not force generating it for what you perhaps bought it for. The first part is: be clear. I hope that the paper later this year is clearer on where those air systems are attributed to. What role are they primarily attributed to? Is it maritime or is it land-based conflict?

With regard to the Prince of Wales—I guess you are talking about the shaft issues with the Prince of Wales—the fact remains, much like Wedgetail, you cannot be in two places at once and you cannot guarantee availability of a platform if you only have one because, at some point, it needs to go in for refit. Queen Elizabeth, next year or 2025, will be in for a refit. The Prince of Wales will take over as a strike carrier attributed to NATO and deliver that effect. If you look at only holding one of those platforms at readiness, and effectively mothballing the other, you do not have a capability that will last any longer than the refit cycle of that ship. As soon as you put it in—

Derek Twigg: Less effective.

Dan Stembridge: Yes.

Chair: A couple of people wanted to quickly come in. Shall we go for Kevan first and then Robert?

Q283 **Mr Jones:** Dan, I was very interested in what you just said about this RAF versus Navy situation. Is there a case for saying that we should buy As as well for the RAF?

Dan Stembridge: You have to make sure that you have enough Bs to satisfy carrier strike. If, politically, we want to have carriers to be able to deliver air power at a time and place you choose around the world, you are going to need aircraft carriers to be able to deliver that carrier strike. If you are going to do it, you are going to need enough Bs to be able to do that. But it comes down, again, to the attribution: what is enough? Is 72 or 73 enough to deliver carrier strike? It is if you attribute them to do that. If you attribute them to also do other things, it is not enough. It depends how often you want to use the capability and at what level you want to use that capability.

There are some areas where you could perhaps look at things slightly differently. Prior to 2018, the OCU—the training organisation for F-35 for



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both pilots and maintainers—was in the United States, with the Marine Corps. We elected to bring that back, on a calendar-based decision, to meet our initial operating capability—to build up our own OCU. We have one frontline squadron and an OCU. For me, that is too out of balance to maintain our own training solution for a force that is that small, when there is potentially the opportunity—we obviously have to ask those people whether they are willing to do so—to move that training back to the US. That would be my personal view. That would then free up the majority of your air systems in the UK for frontline activity.

Q284 Mr Jones: There is an unwritten thing said in the MoD and the RAF, I think, that carrier strike is going to be delivered jointly with the Americans.

Dan Stembridge: You have to ask the other partner what it thinks that means. You can make a statement all you like, but it does not matter if the person who is going to be supporting you in it does not necessarily sign up to that. We have to be careful what we mean by that. There is no doubt that, without the United States Marine Corps and VMFA-211 embarking in Queen Elizabeth for Fortis, we would have been somewhat embarrassed in terms of the number of air systems that we had put on board that carrier. But to assume that, with all the challenges that the United States military has, it has spare capacity to hop on to our carriers—withstanding the sovereignty issues about wanting to be able to deliver sovereign capability as well as joint and coalition capability—is a bit of a tall ask. It is trying to solve a problem with a promise that is not necessarily there.

Q285 Mr Jones: I do not disagree with you, but I think that that is the assumption.

Dan Stembridge: Have we asked the United States whether it agrees with that assumption?

Mr Jones: Well, I possibly agree with that, yes.

Q286 Robert Courts: I wanted to very quickly build on that last point. Doesn't the point about attributability militate towards a split purchase, so that you have Bs to ensure carrier strike with sufficient numbers and then, for mass, As, with the greater range and stores capability that they have?

Dan Stembridge: You could. We always talk about range and payload in terms of the difference of the air systems. Yes, the A has a longer range than the B, but of course you have different basing options with a B that you do not necessarily have with an A. In other words, you can change where your starting point is. It has a greater weapons payload, but it does not have more weapons stations, so it has the ability to carry heavier weapons and we are not integrating those heavier weapons into our system. In terms of those, it is a bit of a moot point on payload.

Are they cheaper? Yes, they are cheaper to buy. Are they cheaper and easier to run? Yes, because they do not have the complexity in there, but that does then bring out the split fleet. Of course, there are costs involved



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in having a split fleet, but there is no doubt that you need to have enough Bs before you start making that decision. Depending on what your overall buy is going to be, it is going to have to be relatively high to make the efficiencies of the A count in a mixed fleet.

Q287 Robert Courts: I will ask the General to comment on that as well. While I have the floor, if I may, can we go back to the Ukraine question? Both of you have advocated against Typhoon and in favour of F-16, and I agree with the points you make on that. One of the big problems with Typhoon is the runway requirement, which also applies to F-16, doesn't it? It is really a matter of being intrigued and of interest. If we were going to be looking at backfilling other partners for the provision of fast air to Ukraine, isn't Gripen the obvious aircraft for this conflict?

Dan Stemberidge: Gripen is a very capable air system. I would put it in the same bracket, but it is about how many are available and if the support solution can support it.

Q288 Robert Courts: General, can I ask you to comment on both those points?

General Deptula: I fully concur with the Captain's comments. I am agnostic to the type of airplane; the issue is getting western fighter aircraft to Ukraine as rapidly as possible. That will make a difference in the potential outcome, as I talked about, because what is happening now is just going to be a slugfest on the ground. It is the individual or the nation state that can provide the greatest number of personnel—remember, Putin does not care about human life; he is just feeding bodies into the fight, but he has got more bodies.

Going back to the fighter operation, we need to get western fighter aircraft to Ukraine. It turns out that the F-16s are the most versatile and available in the greatest numbers. You can rapidly set up logistics, which is the biggest limiting factor in all this. It will take time. I do not want to understate the importance of logistics; it will take time, but there are multiple companies out there around the world that can rapidly set up logistics support by using contractors.

That is a reason that I believe the weight falls on getting F-16s there rapidly, but yes, Gripen could do it, if you could get the numbers and the logistics systems set up.

Q289 Robert Courts: Thank you, General. Can you comment on the F-35A versus F-35B point that I just asked the Captain about?

General Deptula: I listened to the conversation closely. I think his points are very good; however, I would remind this audience that there are over 41,000 airfields around the world that these aircraft can operate from. I believe something that the United Kingdom needs to look at and seriously consider is bringing on board F-35As with their greater range and payload and the lesser cost. It provides you with an option for increasing quantities of an aircraft that can be used extensively around the world.

Yes, there are particular circumstances where a carrier can provide access, but then there are also threats. Look at what the People's Republic of



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China are doing in the context of their anti-access aerial denial strategy of pushing carriers so far out that they would not be useful whatsoever. Again, there are individual, different contingencies where one would find a carrier of use but, frankly, you ought to be considering buying F-35A's between now and when you get Tempest on board.

Q290 **Chair:** Thank you. I am not sure we teased out of you an exact number of the variants you would like to see in order for us to have a sovereign carrier strike capability. Have you got a number in mind? There are these batch numbers that we are going for, I think—48, 72—and the original was 138. We will be lucky if we get anywhere near that. Certainly 48 seems to be a number that has been financed for, with an earmark to 72. I am getting the impression that you would recommend that we stay with the B variant for that full amount, up to 72?

Dan Stembridge: For 72 if you want to be able to deliver carrier strike, then yes, I would.

Q291 **Chair:** For two operational carriers at the same time, rather than for one—

Dan Stembridge: It is one operational carrier at any one time; it is two to deliver you one. If you want to have a single air wing of 24, bearing in mind that they are built for 36, but the ability to surge to 36 if you need it, the answer is 72.

Q292 **Chair:** My related question to capability is that when you look at our land forces, you have a variety of capability leading up from the individual soldier to the APC, main battle tank and so on. There is a graduation in capability, and the same with our maritime forces—corvettes leading up to frigates, destroyers and so on. When it comes to the Royal Air Force, we just go for one, very heavy duty, high octane bit of equipment. The United States has the A-10 Thunderbolt, for example. You have kept that going despite efforts by the United States Air Force to retire it.

The point I am making is that there are environments where you do not necessarily need a very, very expensive piece of equipment to do what we actually spend most of our time doing, which is low-risk, high probability stabilisation events. Afghanistan, for example, is an illustration of that. Would you recommend the UK stay as we are in providing very capable, but small, bespoke assets, or, if funds were available, do you think we should have these other incrementally capable assets, which are more constabulary-duty focused?

Dan Stembridge: I would go with the general's point about nine squadrons. At the moment, you have nine squadrons, so unless you are looking at significantly increasing that number, I would stick with those air systems that will be survivable, as well as being able to deliver those other, less difficult tasks.

There is a perception that F-35 is an expensive air system, but when compared with other comparable, or slightly less capable air systems, it is actually relatively cheap. It does not sound very cheap, but to operate in



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that sense, and the fact that so many other nations are buying it, means there are interoperability opportunities, which builds your coalition and your ability to be able to deliver on a NATO and coalition front. It also gives you economies of scale in being able to support those air systems. F-35 would be the choice in those scenarios, unless we are talking about a complete upboarding and we will have 25 combat squadrons by 2030, which I think is unrealistic.

Q293 **Chair:** Yes, that is very helpful. Final question to you, Captain Dan Stembridge, about UK Royal Air Force training. You will probably be aware that there have been problems in the conveyor belt to produce training. We went up to RAF Marham and met some pilots there who were quite astonished actually at the length of time that it is taking to get them through the conveyor belt from being a cadet all the way through to a frontline pilot. In one case it was 10 years, but I think that was because it was interrupted, but you are still looking at six or seven years as the standard. I think if it was textbook, it would be three and three-quarter years, potentially. With all your experience, you have been a test pilot, and you have seen this for many, many years, what's happened? Why have we ended up in this place?

Dan Stembridge: I think it is very complicated, but part of the reason is privatising and putting it out to industry. In my personal view, there is one constant that we will have in military training, and that is that we will change our minds. We will constantly change our minds over how many we want, when do we want them, where are they going. And so to contract for that either becomes extremely expensive because you are contracting for that flexibility, or you contract to something that looks relatively cheap, and you are contracting to stay down a consistent path. You get what you pay for in that sense. If you do that with a military flying training system, as it was when I went through, it may look inefficient, but you have the ability to veer and haul, and change it, without additional cost.

Chair: Right.

Dan Stembridge: That is one part, I suppose. As for the other parts, take for example rotary wing training. You have three equal partners in terms of equity, roughly, between the Navy, the Army and the Air Force, but each of those operational conversion units has their own requirements. They are, however, fed into a central organisation, which means that that meets all of those input standards. So everybody is getting everybody's input standards in effect before they get to their particular operational conversion unit. That means that the bit in the middle, the frozen middle, takes longer and longer.

Q294 **Chair:** So there is overspecification in that centre?

Dan Stembridge: Yes, I believe so.

Q295 **Chair:** But it was the intent to bring it altogether for that exact reason, wasn't it, to try to simplify the whole process?



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Dan Stembridge: Yes, to try and simplify it, and put most of that training into that middle, so that you did not have to spend it on the OCUs, which is a more expensive platform. But actually, what cost is there to time? If you are now adding years to the training, how are you offsetting that cost?

Q296 **Chair:** As an experienced test pilot yourself—in fact, maybe I can address this to both of you—I think the UK is alone, although I stand to be corrected, in NATO in removing having a fast jet training aircraft as such. The Hawk is being removed from the programme itself; it is now all done by simulator. I think the United States has just signed a big contract with Boeing for the T-7, so they are still using a simpler fast jet to provide that training before you move into your final platform which you would be flying. Do you agree with that decision of the RAF?

Dan Stembridge: For me T mark 1, but not T2. There is still a training aircraft that delivers that fast jet, strike fighter lead-in.

Q297 **Chair:** They don't think that T2 is going to be replaced, is that correct?

Dan Stembridge: I don't know the specifics.

Q298 **Chair:** Well, this is what we are hearing. We are going back to a far simpler model, but it is all done because of cost.

Dan Stembridge: Ultimately, you have got to get the training somewhere, so by the time you get there, you are either taking it out at some point and you are putting it in elsewhere. Although you can supplement some of that with synthetic, as we talked about before in terms of readiness training, you have to actually put your bum on a seat and fly an aircraft.

Q299 **Chair:** Because you cannot still simulate the pressures, the G forces, the intensity and the fact that your life is actually on the line when you are in a simulator, can you?

Dan Stembridge: No, exactly. But there are things that you can definitely do better than in the aircraft in terms of emergencies training, systems training, so there are a lot of things you can do in there that you cannot do in the real aircraft. But there is no supplement for actually spending time in the cockpit.

Q300 **Chair:** General, any thoughts or reflections on this? I do not know whether you are familiar with the road that Britain has chosen to go down.

General Deptula: I cannot speak specifically to that, although in the United States we are experiencing pilot training issues as well. I have talked about this with several folks over the past couple of days. I would just offer at a macro level an explanation of the challenges that you are facing in the United Kingdom, and we are also facing in the United States.

There are three major elements involved with training combat pilots: there is the basic pilot training piece; there is the fighter upgrade or conversion training; and there is operational qualification training. If you think of each of these elements as a pipe, for the entire enterprise to work efficiently



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and effectively, each of the pipes needs to be sized to match one another. So, the pilot production pipe needs to be large enough to meet the ultimate pilot demand; the conversion training pipe needs to be sized to meet the needs of each combat aircraft type; and finally, the operational units require sufficient aircraft to absorb the new conversion pilots. So, if any of those is out of balance, so will be the entire system. It is extraordinarily important to recall that in World War two, Germany and Japan saw their air forces fail for want of pilots, not aircraft. The UK and the US Air Forces are risking the inability to backfill combat pilot losses, because their pilot training enterprises are too small and/or lack sufficient surge production capacity.

Chair: Yes, they are also getting lured away by other aviation jobs, which is another concern, too. Thank you very much indeed. We very much appreciate your time, Captain Dan Stembridge, and General, really appreciate your getting up so early in the morning to join us from Washington DC. That brings to a conclusion our study today on aviation procurement. Thank you to staff and to colleagues.