

**Interview of Air Marshall
Greg Bagwell by Chris Cole,
Drone Wars UK.**

(See: [‘Thinking war is bloodless is a mistake’. Talking drones and remote war with Air Marshall Bagwell’.](#))

CC: Greg, thanks very much for doing this.

GB: No problem.

CC: We appreciated what you have said, as President of the Air Power Association, that in order to have more public understanding of these issues there needs to be more openness and less of the ‘control the message’ culture from the MoD.

GB: Well, secrecy is necessary in some areas, but there is space for more openness I think.

CC: Can we begin with a little background? You’ve spent a lifetime in the RAF, and over the last decade or so, in some senior roles finishing last year as Deputy Commander Operations. Can you tell us a little bit about what that involved? The role is dubbed the RAF’s senior war-fighter I think?

GB: All actual operations are discharged through other agencies, such as PJHQ in Northwood or deployed locations. That role is primarily about ensuring that the RAF has everything it needs to carry out the mission that it has been tasked to do. So, platforms, munitions, people, training etc. So the role is about readiness and always trying to be one step ahead of the operational pull.

CC: Let’s get the naming issue out of the way. Most people – industry, government, academia, media – use the term ‘drones’ but the MoD persists with the cumbersome

'RPAS'. And we also have now the re-branding of the Extended Ranger Predator B as 'Protector'. What's your take on the naming issue?

GB: Well as you know there is a degree of sensitivity about the issue due to the public controversy around them. I struggle to see why people single out this platform to focus on. Yes, drones, to use your word, tend to be sometimes employed on the more secret, clandestine missions but most of the time they are used for routine operations in the same way as Air Seeker, Tornado or Typhoon. But they have become totemic.

CC: You use the word 'totemic' and I think that's important. People often ask us why we are so concerned about drones, but it's because drones concretises a number of issue, ethical, moral, legal, about modern warfare and people talk about drones so they can talk about these issues.

GB: I have no problem with discussing the issues, but where I struggle is singling out drones. I think we have ended up pulling drones into a special place where they are singled out for commentary. When, actually, if it's the idea of having a 'kill list' you want to talk about or the targeting of individuals, that's a legal argument. It's not about the tool you use, that's just the method. You could just as easily – well not just as easily – but you can possibly do that with a number of tools...

CC: But that's the nub of the argument isn't it? When you say you can 'just as easily do it with other tools', can you?

GB: That's why I corrected myself. You're right it's not just as easy.

CC: Exactly.

GB: What I mean by that is that is, if you need to watch a compound for 24 hours with a platform that has a weapon on it, which is the most likely platform? The one that is able to sit there for a long time, or one that has limited amounts of time overhead and so you'll need to bring another aeroplane to come in?

CC: Well, we could easily go into a long debate here, and I'm sure we will, but before we get into the wider arguments can we cover some operational stuff?

GB: Sure.

CC: I'd like to ask some questions about interoperability and the flipside of that, sovereignty. You signed the Memorandum of Understanding (MoU) on behalf of the UK that let the RAF and the USAF use each other's Reapers for agreed operations.

GB: I did, and it still stands as far as I know.

CC: We were surprised when it was revealed towards the end of Operation Herrick that the UK had used US Reapers for more than 500 missions in Afghanistan. There is a concern that this very tight interoperability that's enabled by remote unmanned systems can lead to a blurring of the lines. That differences in Rules of Engagement (RoE) and Targeting Directives can be got round by switching from one nation controlling the drone to another, and that is bound to be more of an issue as other nations begin to use these systems.

GB: No, no no. There is no blurring of lines. When UK crew use a US asset, or vice versa, there are two 'votes' if you like. The US gets a vote on what that asset can be employed on, and of course UK rules of engagement also apply. Neither side can borrow each other asset and use it for a secret mission without telling the owner what is being done. And this is not new at all, and not restricted to Reaper. We have RAF and Royal Navy aircrew flying US aircraft in combat, we've been doing it for years. I did an exchange with the Royal Canadian Air Force and flew in the first Gulf War with the Canadian Air Force. This is not at all new.

CC: Of course, we understand that. But the concern is that with drones, crews can simply be swapped to enable countries with different, perhaps more amenable ROE for that situation, to take over. For example in his autobiography Matt Martin recounts an incident from 2006 when a British pilot was flying a US Predator over Afghanistan. The British pilot "wavered", as Martin put it, from undertaking a strike apparently due to British rules of engagement. Martin, as mission commander, despatched an American crew to the Ground Control Station to take over the controls and the strike was duly launched, which Martin reports killed "four hostiles".[\[1\]](#)

GB: Well that is the difference between a Predator and a manned aircraft.

CC: Yes

GB: That decision of that crew not to shoot will have been based on them applying UK ROE. The one big difference between unmanned and manned aircraft, if that was a British pilot in a US Marine Corp F18, you clearly can't lift them out of the cockpit.

CC: Exactly.

GB: So what you would do is that you would send another aeroplane in with a US crew and the original aircraft would be pulled out – that happens. Clearly with an unmanned, you can just pull the pilot out. It's a little weird, but the principles are just the same.

CC: Well I see it as an important difference, and I think it will become more of an issue – especially for accountability – when multiple nations are operating these systems. When the British, French, Italians, Dutch and so on, all engaged in joint operations, with these systems and can all swap crew. I think there will be real accountability and transparency problems.

GB: Well, there has always been debate about issues of legal responsibility in joint operations, but there are clear mechanisms, with lawyers directly involved to solve any conflicts. It's one of the strengths and weaknesses of working in coalition. And the reality is that these things are mostly sorted out in advance of any particular mission. You employ an aircraft or an asset from a particular nation that is more likely to be able to prosecute that mission because their rules of engagement allow that mission to take place. Now if there is a 'pop-up' situation and your nation's asset happens to be nearest, but there is a RoE issue, what will happen is that your aircraft will be moved off and another's will be brought in. Now obviously in an unmanned system you can do that by just changing who is in the chair. It's not quite that simple, but the principle is exactly the same.

CC: Well again we could talk more about this, but I need to move on as I have lots to ask you.

GB: OK, go on.

CC: So, the MoU covering the ability of the RAF and the USAF to use each other's Reaper drones relates strictly to Centcom Area of Responsibility [US military command responsible for, roughly, the Middle East].

GB: Yep.

CC: During your evidence to the APPG inquiry you mentioned that there was discussion about extending this to Africom but it never happened. Can you say why?

GB: That's a good question. I was keen but basically Centcom was the area, and has been for some time, for operations, and bureaucracy got in the way.

CC: So it wasn't a deliberate decision to bind it to the Centcom area, it was just bureaucracy that extending it didn't happen?

GB: Well I thought at the time that it made sense to extend. Why limit it in this way? But in the end, the MoU needed to be signed and it was seen as too difficult to extend it further.

CC: So, the other side to interoperability in some senses is sovereignty. At the Waddington media day in late 2015, Air Commodore Jeff Portlock said that the UK was getting very close to sovereignty in regard to Reaper, but we are not there yet. So what is it about Reaper that isn't 'sovereign' is it the sales agreement? Is it some proprietary technology?

GB: Sovereignty is a tricky one. Pure sovereignty is 'I make it, build, it control it, operate it, completely independently'. Nobody can touch my supply chain, nobody

can turn a switch of. It's mine. I can do with it what I like. Now if you buy something from another country, by definition you don't have sovereignty. And there are certain bits of the capability... I'm not going to go into detail, but you can imagine the sort of network that is required to enable these systems to cross the globe.

CC: Oh, go on...

GB: (Laughs) I'm not going to... There are things out there... The drones are not the issue, it's the system.

CC: Well I want to come on to that...

GB: Your ability to have a completely enclosed, separate system is what denies you pure sovereignty. And in some senses you don't want it. You want to have a network where you can all inter-operate. The question is, do you really need 100% control?

CC: So could the UK deploy its Reaper drones to Mali, for example, without...

GB: Without any support? Without any American support whatsoever? No. Currently that would be... challenging. It's theoretically possible, but we would not have the same capability that we currently have. But that's a limitation, we are not being held hostage by anyone.

CC: Well, as you have said – and I agree with you – this is not just about the platform, the unmanned aircraft itself, it's about the whole system. The Command and Control elements, and the processing and distribution of intelligence and data. Its public knowledge that UK Reaper uses the Primary Predator Satellite Link (PPSL)

at Ramstein. So does the UK use US satellites to control Reaper, or the UK Skynet system, or both?

GB: That's actually outside my area of knowledge, to be honest. It's fair to say that we are using different constellations, not all of which are ours.

CC: OK. And the other side of that, the distribution and analysis of gathered intelligence. Presumably on joint operations, like Herrick and Shader, the information that is gathered by UK Reapers, whether it be full motion video or signal intelligence or whatever, that's processed by the coalition? It's not just processed by the RAF?

GB: Yes, well this is where we get into classified stuff. There are a variety of different 'clubs' if I can call them that. So for example the Five-Eye community [Australia, Canada, New Zealand, the United Kingdom and the United States] which shares very high grade, very sensitive intelligence amongst the five partners. Some of that info cannot and will not be shared with others.

CC: Even with other members of the coalition?

GB: Yes, even with other members of a coalition you are working with. There are some things that you will share, of course...

CC: So just to be clear, even though you are on a coalition operation, you don't necessarily share everything gathered amongst the coalition?

GB: Correct. There are all sorts of alliances and reasons why even within a coalition you maintain secure networks. It is complicated and it can be painful, but it's

designed to maintain secrecy. The natural instinct, the default of any coalition, will be to share as much as possible. Certainly to share anything that is needed to get the mission done.

CC: In terms of processing the gathered data, the full motion video, the intelligence, presumably it all goes to the CAOC [Combined Air Operations Centre. For Operation Shader/Inherent Resolve this is Al Udeid Air Base in Qatar]?

GB: Absolutely. It will be on the screen live...

CC: And it also comes to the UK to be processed?

GB: Yep.

CC: To be processed at RAF Digby, RAF Marham etc.?

GB: Well there is a variety of places but a lot of that has been brought together now at Intelligence Fusion Centre at RAF Wyton.

CC: So as well as getting looked at in real time, it gets looked at afterwards?

GB: Yes, there is a variety of different phases of analysis. There will be people using real time intelligence for real time decision making, and obviously that's live. And then you have got second order, third order, fourth order etc. and you will be doing that to build an intelligence picture over time, you will be doing it to look at developing

a target set over a week or two. So there is a whole variety of different requirements which will use the same data more than once.

CC: Practically speaking, do you think it's possible to keep such intelligence away from the Americans when there is such a high degree of sharing with them? I'm thinking of when people say, for example, that we should not be sharing intelligence that could be used for targeted killing outside of war zones. In your opinion is that possible to do?

GB: Yes of course. Now could a fellow alliance partner be spying on you? Well, maybe, but quite frankly if we couldn't keep secrets from each other, they wouldn't trust us to be in the Five Eyes club, would they? So yes, there are various levels of information management and some of that is 'UK Eyes Only' and that is heavily restricted.

CC: Let's go on to another issue that I know you have a particular interest in, crew issues. As you are aware Reaper has been deployed now for 10 years and when I talked to 'Justin Thompson' the former RAF Reaper pilot earlier this year, he talked about the incessant nature of Reaper operations.

GB: Yes.

CC: And I think this is another area of difference between manned and unmanned systems. Tornado and Typhoon are deployed on operations and then come home. Reaper seems to be permanently deployed. We have heard recently from Air Commodore Stringer that the Reapers will continue to be deployed even after

Tornado and Typhoon comes home. What's your reaction to that on-going deployment?

GB: Well, the operational reason has to make sense. It still may be that you would want a degree of surveillance to help the Iraqi armed forces stabilise the situation but you are unlikely to need strike assets. So that kind of shift would make sense to me. Does it bother me? No, I think it's the nature of the beast. What we have now is a surveillance capability that will always be in demand, will always be employed to the maximum. The trick is to sustain that to a level that is manageable. So how many crews you have, how many times they fly per week, how you rotate people, is all fundamental to the long term health of that force. I think we got it right, just, in that our numbers and the promise we made in terms of what we could do with what we had were sensible and manageable.

CC: You said at the APPG hearing that you had "held the line". That there was pressure to increase the number of missions.

GB: Huge pressure. I think there was something of a belief that we were deliberately holding it back, to limit the number of unmanned missions to make some kind of argument for manned aircraft, but that just wasn't the case. It was about fatigue and the pressure on individuals.

CC: We saw in the US the pressure and fatigue on Predator/Reaper crew have an effect.

GB: They went for a much harsher regime and we saw the long-term effects of that.

CC: Do you agree that these types of remote operations, flying conflict sorties and then going home to the family at the end of the day, brings a special sort of pressure?

GB: Of course. And I understand that because I flew missions over Kosovo from my home base and used to go home and have breakfast with the kids so I've been there and done it, so I know. As the situation in Iraq and Syria calms down and we move to surveillance missions, I think that won't be as debilitating as launching strikes everyday which clearly has an impact on the individuals.

CC: Well, they're likely to be armed missions aren't they?

GB: Not bound to be.

CC: Not bound to be, but likely to be I think...

GB: Well I think while the Iraq authorities have been happy to have Reapers flying overhead while Baghdad, Mosul etc. is under threat, but they will be less so as things stabilise and there will come a point where they will say 'Actually America, Britain, we don't want your planes wandering around our airspace with missiles on.' That's what I would do if I were Iraqi.

CC: Well I think it's not unlikely that the US and the UK will say, 'Hang on we have done you a big favour over the last three years, we want to continue to fly here for our security'. We have had the Defence Secretary saying he wants to continue to launch strikes at those who are deemed a threat and so it goes on and on and on...

GB: Well what politicians say for media consumption are not necessarily how operations are done. The military operation world is a very controlled and responsible place. What's said to newspapers for particular agendas is another matter.

CC: Well I think that's very dangerous.

GB: He's trying to send a message. Presumably he has thought this through and his primary message is that if you join a terrorist organisation on your head be it. And that's not a bad message to send, is it?

CC: Well I think his message needs not to ignore the law. But one more thing on crew issues before we move on. You talked in your evidence to the APPG – and it was picked up by the media – that the RAF should perhaps be looking at taking 18/19 year old PlayStation gamers out of the bedroom...

GB: My point was – and this was in the context of how we sustain on-going unarmend operations – we have to ask ourselves do we need to train someone to pilot an aircraft before they can operate Reaper? Or are people able to be a Reaper operator without flying experience? We, the air force, have held a fairly tight line in that you need to understand the air domain quite well and then we can adjust you for remote operations. However, we have trialled individuals, who have done very well, who have not had a flying background and gone into the Reaper training programme to see how they have coped...

CC: Really?

GB: Yes, we have had non-pilots go into the training system to see how they coped.

CC: But they haven't flown operationally presumably?

GB: Yes they have. They undertook a slightly more rudimentary training regime than a fully trained RAF pilot, but enough to give them the basic skills and airmanship. It's a very carefully controlled training regime. It's not an aeroplane, it doesn't require the same degree of understanding of flight, but you do need to understand the air domain and your place within it. The good thing about being in a Reaper cabin is that there are other people with you to assist, and the system is heavily automated. It looks after itself a lot of the time. So there is lots of reason why you can take a higher level of risk in how you train people to operate.

There is an argument that the generation that have grown up playing PlayStation have become very adept at thinking in three-dimension, managing systems and networks, very dextrous use of controls, and we need to think about whether that is something we can exploit.

CC: We found that very interesting of course because drone campaigners have been castigated for comparing the use of drones to video game warfare. Yet here you are advocating that...

GB: Well, that's because the connotations of what you are saying is that it's a game, it's not real. You're killing targets on a screen and not real people, that's where that is taking you.

CC: Isn't saying we can take 18/19 year old PlayStation players from the bedroom perhaps encouraging that?

GB: No. It's taking a skillset and managing it carefully in order to be able to translate those skills into an operational environment, but still bringing the moral and ethical view that we have to bear.

CC: I'd like to ask about the RAF's Reaper missions inside Syria before the December 2015 parliamentary vote authorising the extension of operations into Syria

GB: Sure.

CC: You will remember that the resolution authorising military operation against ISIS was strictly within Iraq.

GB: The restriction was on where we could conduct offensive operations, not where we could fly, and other coalition aircraft were operating in Syria from the start. And don't forget, we had a directive to fight ISIS, which was an organisation that did not respect borders.

CC: Yes, but strictly within Iraq.

GB: Strikes were restricted to Iraq until the vote in December 2015. But the objective, the mission given to the operational commander, was the defeat of ISIS. It was a bit like saying we want you to win the FA Cup, but you can only play in your own half.

CC: Well, it's not like that. It isn't a game. There are sovereign boundaries.

GB: Yes but, Parliament was still reacting to the August 2013 vote that was aimed at strikes against the Syrian regime. The situation had changed with the new target being ISIS. If you say to someone I'm going to bound you geographically to where you operate, completely reasonably – and clearly a democratic right of parliament to do that – but the mission called for the defeat of ISIS, you can't have it both ways.

CC: So the discussion about whether to do this, to go against the parliamentary resolution and to fly Reaper into Syria, was that controversial?

GB: No, we didn't go against any resolution. Flying aircraft in Syria was authorised, manned and unmanned, and other coalition members were doing it. It was just UK offensive strikes that had not been passed in parliament. But as I said, that debate was still somewhat constrained by the failure of the earlier vote, which was for a different purpose. It wasn't controversial, it was frustrating.

CC: I don't agree that the September 2014 resolution authorised missions in Syria. Was no one saying 'We shouldn't be doing this' or 'We should go back to parliament'?

GB: No because missions were authorised, non-offensive missions. However, from a purely military perspective it was a challenge to have the most vulnerable aeroplanes flying in the higher threat areas, but we were able to rely on other coalition partners to provide appropriate support and protection.

CC: Who authorised it?

GB: As far as I was concerned the Ministry of Defence and higher operational authority. Parliament isn't consulted on every aspect or every operation.

CC: So it wasn't parliament.

GB: Parliament only made reference to offensive or strike operations, non-offensive operations were not excluded.

CC: From our perspective, it's obvious that unmanned systems made a difference here. No one wanted to risk manned armed aircraft, so the UK chose to intervene in another country – to cross the border into Syria – by using unmanned drones.

GB: We operated both manned and unmanned surveillance missions before December 2015. But the mission as given was the defeat of ISIS. Restricting UK offensive operations to Iraq was – militarily – inefficient, as we were allowing ISIS to operate freely – to re-supply from Syria. That said other Coalition members were conducting strikes in Syria.

CC: Well that was of course the argument, but that argument needed to be made in the House of Commons in order to get the proper authorisations for the missions

GB: Well they were and ultimately carried the day. Parliament gave its authority for UK offensive action in Syria and sense prevailed.

CC: But only a year later...

GB: Well, that's democracy. We worked within the rules and we had to live with those limitations.

CC: Well I fundamentally disagree with you about that. From my perspective, flying armed Reapers into Syria at that time was breaking the rules.

GB: Well from my perspective it frustrated the hell out of me that we chose to limit those operations.

CC: Well, can I come on to the Reyaad Khan strike. And I know this is one of the areas that you may not be able to talk much about.

GB: Yes.

CC: The MOD has been very clear that the strike operation, and presumably other ISR missions associated with it, were not part of Operations Shader but part of a UK counter-terrorism operation. So it would be helpful to try and understand the process here. If a decision is made at the National Security Council at what point does that come down to operational commanders? Can you tell me about the process at all?

GB: Well military commanders will be given missions to conduct and will be given rules of engagement and targeting directives to do that within the law. How that is arrived at is a matter for government, the Attorney General and others. Clearly we would not follow an illegal order so we have to be comfortable that the order we have been given is legal.

CC: I was going to ask, is it unusual to have operations going on in the area in which you are the military commander that you wouldn't know much about?

GB: You might not know the detail, but you would be aware of the presence and the potential implications. If you are fighting an organisation, you want to map out its network, to know who its head is, who deputies are, where they operate from, supply chains, networks etc.

For example, if Khan had been in Iraq as part of an ISIS attack on Mosul, he would have been a perfectly legitimate target under UK RoE. However he was elsewhere and someone had decided that he was legally a threat and when or if the situation presented itself he could be targeted.

CC: In your evidence to the APPG you said something that I thought was important. You said that Obama kept the authority for some of these strikes to himself because they are as much a matter of politics as they are of law. I think that's an important point.

GB: Just because an attack is legal, doesn't mean it is the right thing to do politically or morally. And we have seen situations where operations are kept separate, such as US strikes in Pakistan being outside of the NATO Afghan mission.

CC: And that was the same situation with the Khan strike.

GB: In a way, yes.

CC: Another aspect of this is the Attorney General's speech arguing for a widening of the definition of imminence in relation to pre-emptive strikes. As you know, there are very different opinions about the legality of all this.

GB: Sure.

CC: So how do senior commanders deal with this? How much responsibility do you as a senior operational commander take for this? Or do you say to yourself, the lawyers say it's a go, so I go?

GB: Well, he is an enemy. He is a threat. My task is to defeat the enemy. Does the elimination of that individual further the success of the mission?

CC: Well the judgment about whether that person, at that moment, is a legitimate target, is legal issue.

GB: Of course, but I don't have any issue with Khan being called an enemy combatant. He had clearly engaged and would continue to, so to me that's a target. We could have the argument about whether this encourages more people to join the enemy. I don't know whether some young person in the UK seeing another Brit killed in a UK military operation will be encouraged to join ISIS or discourage them. If it discourages them, I'm all for it. If it encourages, then we got it wrong. That's a very difficult thing to judge.

CC: You've said that you spoke to the crew involved in the Khan strike and felt uncomfortable with the critical press coverage of the strike.

GB: I felt for them, being effectively criticised for doing their job. They were operating under a UK agreed position.

CC: There were reports as you know of 'disquiet' among senior officers about the crossing of the Rubicon with this strike. Is that something you are aware of?

GB: No. If that had been someone with a different passport we wouldn't be having this conversation. It's just because he had a British passport this is a big deal.

CC: I disagree. I don't think it was just because of nationality. It was because the strike took place in Syria and we were not at war there.

GB: But we were at war with ISIS. I argue that the application of national boundaries here was less relevant.

CC: But there are geographic boundaries to this. If there is a member of ISIS in Tunisia say, the UK is not entitled to strike there.

GB: Of course, but in this case, ISIS in Iraq was being sustained by and supported from Syria, so I would have had no problem with the strike.

CC: OK. I'd like to ask about civilian casualties. As you are aware the MoD continues to say there is no evidence of civilian casualties despite RAF conducting 1,600 plus strikes firing 3,000 plus munitions.

GB: Well I think it's unfortunate that we continue to maintain a pure 100% argument. Although we do our utmost to both prevent civilian casualties and conduct post-strike

analysis to confirm, I don't think it is credible to the average listener that we have not caused any civilian casualties just because you have got no evidence to the contrary. It is almost unbelievable that someone, somewhere, has not been killed by accident; although we have not been presented with such a case yet.

CC: It is unbelievable.

GB: I accept that and it also perpetuates a myth that wars are bloodless.

CC: Exactly. And lots of people are now saying there needs to be a change from the MoD on this.

GB: Well I will defend the fact that the MoD has put 100% effort into trying to avoid civilian casualties. I just think it's wrong to let people think that no-one has been killed, but we do try our utmost.

CC: One of the things that our friends at Airwars have questioned is whether UK battle damage assessment processes are fit for purpose now. Do you think it would be good to look at that?

GB: Well I'm sure there will be all sorts of studies into this, to try to uncover the truth of it. But you can't see through rubble. We do put a lot of effort into battle damage assessment. Partly of course because we want to know if we have achieved the aim of the strike, but also because we want to be able to refute any propaganda claims by the enemy.

CC: On the wider question about whether we can carry out air war without civilian casualties...

GB: Yes, there is a danger at the moment that we are conditioning ourselves to think in a certain way, that wars are bloodless and that we can carry out war in a nice way. Thinking war is bloodless is a mistake because we need to be aware that war is nasty and opting for it, must be the last resort. Thinking it can be done cleanly etc. is a mistake.

CC: But that's what the message that is being put forward at the moment, in all sorts of ways, that we can wage war without consequences.

GB: Well nobody is claiming there are no consequences, lives and homes are in tatters and the geo-politics continue to evolve. However, the 100% claim and the incessant pressure on its defence has frustrated me. I'd rather we said we make every effort and that we strive for 100% perfection but can never be sure with absolute certainty, despite every effort to try. Standing up and saying we are 100% perfect on this, who is going to believe that?

CC: People don't. A somewhat related issue is what has come to be called 'risk free' war. The fact that by using remote-controlled unmanned systems you can launch strikes thousands of miles away at no risk to your personnel. The MoD said in September that some 3,000 ISIS fighters had been killed in RAF air strikes, yet we haven't had a single UK military personnel killed in enemy action. When you have got such radical asymmetry, is that war?

GB: Well it's a way of fighting, certainly, that probably gets an enemy to change its tactics. In the first few months of this, ISIS were driving convoys marked with black

flags. They didn't do that after a while. But when you have an asymmetric advantage enemies seek to find a way around it, and that is what terrorism is. There is a danger that you shift the way an enemy targets you and looks for vulnerabilities, and that is where we find ourselves.

CC: Well it's important I think that someone with your military experience says that. Sometimes when that argument is made, it's said that it's in some way a justification for terrorism, which is nonsense. We have to have a grown up debate about this.

GB: It's not justifying terrorism. It's what anyone would do. You exploit your strengths and you avoid your weaknesses and an enemy that is facing overwhelming air power isn't going to try and take us on in that way.

CC: Let's come on to the future. The UK is clearly investing in unmanned, buying more of the Reaper type systems but also funding development of future systems. And of course, autonomy is clearly an issue here. As someone who has operated at the command level, what is your view of increasing autonomy? I'm not just taking about killer robots, but using autonomy to trawl data and find targets.

CC: Well there are already autonomous systems in operation today, such as the Phalanx system, or when you fire an air-to-air missile which becomes active at a certain point and handles the end-game. So within certain boundaries we have this already, to a degree. How you put boundaries on this is the issue here. Do you send a drone off with a photograph of a legitimate target and programme it so it doesn't come back till it's found them and killed them? I think that's a bit of a way off, but if you could guarantee it 100% worked...?

In many ways we have chosen to do the complicated thing first. Why hasn't there been more development of autonomous ships or tanks? The air domain is much harder than land or sea. Perhaps it's because the air industry is much more technologically minded and more forward thinking, I think we have ended up getting ahead of ourselves here.

CC: I agree that a lot of this is being driven by industry.

GB: There is still huge scepticism of driverless cars, of pilotless airliners, so why we are pushing for this in the hugely difficult area of combat aircraft is a bit of a mystery. We all know that the most likely cause of car and aircraft accidents is human error. We could, in theory eliminate that tomorrow by using autonomous systems in cars and airliners, but we won't.

CC: One of the things that we most value is 'humanness', human judgement. For us the worry about bringing autonomy into the kill chain is eliminating human judgement. We think that's very dangerous.

GB: I think autonomy will advance in the military arena but there will still be someone in the loop, someone making the moral, ethical, legal choice about strikes, otherwise, we will have gone to a Terminator world, we will have lost control.

CC: I agree, and I think that's a good place to stop. So thank you very much again for agreeing to discuss these issues, it's very helpful.

GB: You are welcome.

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[1] Matt J. Martin, Charles W. Sasser, *Predator: The Remote-Control Air War Over Iraq and Afghanistan – A Pilot's Story*, Zenith Press, 2010, p.285
