

# AIR POWER 2010–2020

## FROM HELMAND TO HYPERSONICS

*JOHNNY STRINGER*

An examination of air power employment over the last decade yields lessons and deductions from some exceptionally challenging operations in deeply complex environments: geographical, political and informational, but also increasingly shaped by the information environment, and with multiple audiences, actors, and adversaries. The West and its allies are at an inflection point in the employment and utility of air and space power; we no longer own nor can dictate all the terms of the debate.

An air power author writing in mid-1991, especially one serving in an air force, would be forgiven for reflecting on the recently fought Gulf War and feeling a sense of achievement and perhaps vindication.<sup>1</sup> That war had demonstrated to allies, adversaries and competitors just what the fruits of the United States' Second Offset Strategy could achieve.

The key constituent parts—satellite navigation, air- and space-based reconnaissance, extensive and secure communications, miniaturisation, precision weaponry and stealth technology, underpinned by exponential increases in computing power—had been employed by the coalition air component with astonishing effect, allowing a 100-hour land campaign with a fraction of the allied casualties that had been predicted. The No Fly Zones that were established throughout the '90s appeared to bear out the idea that the West had pioneered a new way in warfare—a revolution in military affairs even—with air and space power at its core.

The more considered analyst would have seen signs in subsequent air operations over the Balkans and northern and southern Iraq that questioned such confidence. Political and coalition realities and constraints, confused strategic objectives, and the attendant operational challenges had limited or even at times neutered the air instrument. The Kosovo campaign of 1999 might have led some to see it as the zenith of air power; in reality, political pressures forced Milosevic's hand too.

Ten years later the score card was more mixed: the Taliban had been removed from power after 9/11, Saddam had been deposed (another showcase for sophisticated joint operations) but in Afghanistan and Iraq the Western coalition was fighting bloody

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and violent insurgencies, with the land environment the main focus for military and political leaders alike. The seemingly swift and relatively bloodless experience of the 1990s had been replaced by drawn out counterinsurgency (COIN) campaigns, slowly leaching public support and political tolerance. Air power had become an almost wholly tactical instrument, supporting others but not making the decisive strategic campaign contributions of the relatively recent past.

The period 2010-2020 has offered fresh insights into the utility and evolving character of air and space power: continued operations in Afghanistan, whilst simultaneously being employed to protect the Libyan people from Gadhafi and ultimately allow for his overthrow. Having largely left Iraq by 2011, the West returned in 2014 to fight Daesh, conducting air operations over both Iraq and Syria.

This article explores air power employment over the last decade in these three campaigns, drawing lessons and deductions from some exceptionally challenging operations in deeply complex environments: geographical, political and informational, but also increasingly shaped by the Information Environment, and with multiple audiences, actors and adversaries. The West and its allies are at an inflexion point in the employment and utility of air and space power, and we no longer own nor can dictate all the terms of the debate.

## The Essential Glue

Air and space power are essential to any modern campaign; it would be unthinkable to go to war or to conduct operations without assured access to both domains and thus the possibilities provided by the vertical flank. It doesn't follow that they are employed in the same way regardless of the fight, and thus the actual utility of both has seen different expression over the last 10 years. In Afghanistan, the preeminence of the land campaign drove the employment of tactical fast jets, the tasking and collection for intelligence, surveillance, and reconnaissance (ISR) assets and much of the Air Transport fleet's use too.

Both support and attack helicopters provided intimate land support—their *raison d'être*—to support individual tactical engagements. One could view the Afghan campaign as a series of tactical fights at varying scales, conducted across the country and orchestrated at the regional vice Theatre level. In the UK, an argument of “bayonets versus jets” or of tying UK fast jets to UK forces (and thus limiting them to being national and not Coalition/Theatre assets) indicated how polarised understanding and advocacy had become. The debate was only finally concluded when analysis showed that UK ground forces, especially its Special Forces, were getting multiples of Coalition air support in return for each UK air asset provided to the Coalition.

This approach also ensured that overall response times across Afghanistan were optimised, as well as allowing tasking of the best Coalition asset to each mission. A similar approach to the initial use of UK helicopter assets also risked effectiveness. Indeed, rotary wing lift had become a strategic and political issue by 2009 as a perceived lack of helicopters forced UK troops to undertake risky moves by vehicle or on foot. Once again, putting the UK rotary wing contribution into a coalition pot and

allowing optimum tasking and asset utilisation (provided by an RAF Joint Aviation Group commander) addressed both the tactical challenge and salved political angst. It was also indicative of how in the space of a few years, an understanding of the best use of air power had been allowed to ebb away.

## **Not Just COIN**

Much of our employment of air and space power in the last 5 years would be familiar to crews operating in Gulf War 1 and through the 1990s: of note, the junior aircrew in the first half of that decade are now the senior commanders in their respective air forces. There are generations of operators for whom this way in warfare is a comfortable and well-practised default. Although US-led coalitions had to fight for air superiority and ultimately supremacy at points throughout the period from 1991 to 2003—the period bookended by the two Gulf Wars—the move to COIN operations for the following 10 years had both intended and unintended consequences.

For the former, an emphasis on unmanned air systems (drones) to provide extended overwatch and strike was symptomatic of a move away from the primacy of combat air and fast jets. The then chief of the US Air Force was fired in 2008, in part for his continued focus on the threats posed by a revanchist Russia and assertive China, and related support for the F-22 fighter programme. It could be countenanced by the perceived needs of the current fight and tactical support down to sections of troops, and permitted by our absolute dominance—indeed, ownership—of the electromagnetic spectrum (EMS). The Taliban could only contest control of the air by largely rudimentary engagements of helicopters and the occasional success against aircraft at operating locations, the attack at Camp Bastion in September 2012 being the most notable. Coalition access to air- and space-based reconnaissance assets, satellite communications and Precision Navigation and Timing was unfettered.

In Libya in 2011, early strikes to remove the SAM threat in the north of the country allowed the same approach to be employed, although occasional missile launches were defeated by coalition assets. What was fundamentally different was the *de facto* primacy of the air component: absent a Coalition land component, the land campaign was prosecuted by the local Libyan resistance to Gadhafi—effectively as proxy forces—aided by Coalition Special Operations Forces.

The paucity of assets and the size of the operating area proved especially challenging: from the 1000+ missions flown in a 24-hour period during Kosovo in 1999, the UK/French-led coalition could launch around 70-80 missions a day in 2011. No wonder that in the immediate aftermath of the campaign, at a closed door debriefing in London, a senior UK Government advisor opined that he was surprised that the Libyan campaign had taken 223 days “when Kosovo took 78, and it was an easier problem.” Participants were admirably restrained in their responses.

Air primacy over Libya was exercised through the combined air operations centre (CAOC) at Poggio Renatico in northern Italy under US Air Force Lieutenant General Ralph Jodice. The strategy for the campaign nominally rested with NATO Joint Forces Command Naples, but the approach devised at Poggio set the terms for how the coali-

tion operated. The air component was back to Theatre-level campaigning and employment, rediscovering targeting processes (and challenges) almost wholly absent in Afghanistan and needing to explain to the Coalition's political class some of the realities attendant in fighting a state, across the state. Three years later, and coincident with the withdrawal of the bulk of UK forces from Afghanistan and a supposed "reset" in our campaigning, the danger posed by Daesh (also known as Islamic State in Iraq and Syria - ISIS) forced the West and its allies to begin another Middle Eastern campaign.

## **Back to Iraq (and on to Syria)**

For the UK, the air operations over Iraq and, subsequently, Syria, would generate the most significant and extended air effort since the Second World War. This campaign is also where a number of those factors, apparent over the last 20 years, have been realised, and where the themes noted above, and their trajectories, have come together. Indeed, we might be able to identify likely vectors over the next decade. The cautionary note is not to assume that all will emerge or be sustained, and none are likely to be overly dominant or defining. After all, it was only 10 years ago that some confidently asserted that COIN was the future of warfare. However, there are contextual, technological, societal, political and multi-domain aspects that are genuinely different and that have likely longevity and impact, especially on the employment of air and space power.

Firstly, the pervasiveness, breadth and penetration of the Information Environment, now amplified by the post-factual, "fake news" lens through which truth and reality have to emerge, hopefully undistorted. The UK's doctrine and operating concepts are rooted in the importance of securing and maintaining Information Advantage; the default should now be that kinetic actions underscore information operations and not the other way round. For those measuring air power's effectiveness (and national contribution) by counting weapons drops—still a factor in 2017—this requires fundamental recalibration: input-based measures of activity are no substitute for outcomes-focused measures of effectiveness and generate often perverse outcomes.

It also speaks to what was known in Afghanistan and became one of the accomplishments of the Libyan campaign, with information-led activity integral to our approach of full spectrum targeting. But it is not yet fully codified, nor should it set activity in only one place on the spectrum: at times, there is still a need to employ precise but significant lethal force to overcome the opponent.

The importance of the Information Environment is matched by that of the electromagnetic environment and the ability to maintain freedom of manoeuvre across the EMS. Air power is steeped in this (including radar, chaff, jamming and long range communications during the Second World War), but the years in Afghanistan in particular have had a damaging effect on competence and capability. Here, the EMS was ours, and the vital services provided—perhaps most obviously precision navigation and timing, satellite communications, and unchallenged air operations of all forms—were seen as almost a "free good" at point of use. They were expensive, but they were ours, and we built a way in warfare around them.

By late 2015, with the first Russian deployments to Syria, this had changed. Although rows of fast jets would have caught the eye, the most significant Russian capabilities were advanced double-digit SAMs, communications and GPS jammers, and a sophisticated radar and C2 network. Without firing a round or rocket, the deployment altered the operational context for coalition air assets, and generated a new, genuinely strategic set of challenges.

This anti-access/area-denial (A2/AD) umbrella in the eastern Mediterranean covered the key UK air base at Akrotiri and threw its protective bubble over Russian land, air and maritime assets. As noted previously, we knew this was coming—it was an inevitable counter to our way in air warfare prosecuted so successfully over 25 years. Noteworthy too that the imagery—iconography perhaps—of Russian military strikes looked remarkably familiar to that first seen in 1991: the overt emphasis on equivalence masked the reality of Russia's employment of 90 percent unguided weapons and the terror bombing of civilians in Aleppo and other cities.

## **Contextual and Campaigning Evolution**

Societal and political factors have had increasing bearing on the use of air power and on the conditions governing its employment, and on the technologies within the instrument itself. Drones have been a bellwether for this phenomenon, and the UK experience is instructive. The RAF has operated Predator A and B drones (the latter the more advanced and capable Reaper model) since early 2005, but the UK elected to stay almost silent on their operations for several years. This de facto vacuum was filled by others, stating or insinuating various nefarious or even illegal activities on which they were employed.

Belatedly, the curtain was pulled back a little but the UK remains on the back foot, even when the reality is that drones are effectively conventional aircraft that happen to have a cockpit and crew several thousands miles distant. Political considerations will always inform operational policy, and the codified expression of this—allied to international law and conventions—are national rules of engagement (ROE).

Syria and Iraq have presented substantial targeting challenges as noted previously; the years of targeting individuals in unoccupied expanses of desert have not fitted military personnel well for the realities of employing precise but lethal force in dense urban environments against opponents for whom the people are targets, shelter, revenue and recruits. As the air component commander during the operations to liberate Mosul and Raqqah, every day posed numerous targeting challenges; keeping senior staff in the UK informed on these—and how we were overcoming them within the ROE—was vital ground in maintaining trust and confidence in our judgment and decision making.

The proximity of multiple actors provided further complexity: the battle space in Iraq and especially Syria was and is the most congested, contested, competitive and at times confused that any of us can recall in the last 30 years. The potential for tactical-level errors to have strategic consequences was ever present and required consistently

good analysis and judgement, often from relatively junior personnel in the CAOC and from coalition aircrew.

We should also reflect on the realities of campaigning in coalition, viewed from the perspective of the air component. If ROE reflect national policy positions, then it is axiomatic that they will differ across nations although all will be legally compliant: this translates into mission types or target sets that one or more nations might be unwilling or unable to conduct or prosecute, even if they have the professional and technological ability. It is also a truism that the more meaningful the contribution, the greater the level of political and other risks nations must be willing to accept.

Once again, tactical limitations can have unforeseen strategic and/or campaign consequences. Commanders must continually review their permissions and delegations to ensure they are appropriate for ever-evolving missions and be willing to argue for refinement if necessary. It may also be that standing ROE have been deliberately limited; the case for unlocking them has to link the tactical requirement and benefit with the oversight that will ensure risks are managed and kept below the agreed threshold. This will almost certainly require high-level government and ministerial approval: commanders must possess the advocacy and antennae to operate in this environment too.

Operations against Daesh also provided the best example yet of integrating effects across multiple domains. With air- and space-based assets collecting ever-increasing imagery, signals intelligence and other intelligence data, their centrality to rapid understanding is a given; the ability to fuse this with all source intelligence, including from our cyber operations, is where real and decisive advantage is rooted. Multi-Domain Integration across tactical, operational and strategic levels remains a work in progress and is not yet our default setting, but we have made significant inroads in recent years.

The work in late 2016 and early 2017 to understand Daesh's vehicle borne improvised explosive device (VBIED) capability and then target it across the enterprise represents an excellent example of both opportunity and challenge. A conventional approach might have sought to 'soak' likely areas of interest with the ISR assets we could muster (but prejudicing other high-priority tasks) and have strike assets on call to engage (but tying them geographically and by mission).

Instead, patient and imaginative interagency work allowed the coalition to understand how Daesh developed and fielded their VBIED capability—down to what we could call the lines of development—and the CAOC staff then refined its intelligence effort against key nodes. Given the commercially available Chinese drones used by Daesh, alongside those built by their own nascent armaments industry, this included activity many miles from the battlefield. The challenge, beyond maintaining necessary operational security, included preserving tactical and operational patience across coalition HQs, where early strikes would have failed to achieve the overwhelming effect of coordinated action. The simultaneous strikes conducted in early 2017 were a precursor to a number of other similarly well-integrated actions as the physical "Caliphate" was reduced to its final few square miles.

## **Regaining our Advantage**

Much of the above speaks to a democratisation of what previously were high-end capabilities, the product of expensive and leading-edge technology and thus for many years largely the preserve of top-tier Western nations, much of it from the United States. Today, traditional competitors have achieved at least near-peer status in almost all areas of air and space power; worryingly, their investment in countering and exploiting the EMS whilst we were focused on violent but relatively unsophisticated COIN campaigns has been well worth the cost. Western nations are playing catch up, rethinking old lessons on resilience and dispersal whilst regaining competence—if not yet competitive advantage—in areas such as hypersonic weapons.

Western air power is challenged at both ends of the spectrum too: Daesh drones may have been unsophisticated when compared to a Reaper, but were employed across four of the five core air power roles—intelligence, strike, command and control, and counter-air (when attacking Russian aircraft at Hmeimim Airbase in Syria). As with the cyber domain, the price of entry is now remarkably low, and imagination in employment has a value all of its own. It is also worth reflecting that digital and IT connectivity allowed Daesh to mass produce weaponry to remarkably precise tolerances at multiple sites, from mortar rounds to the stabilising fins for repurposed 40mm grenades, dropped by drones on Iraqi Security Forces and the forces of the Syrian Democratic Front.

Daesh drones represented their own air power capability, whilst the raft of commercially available satellite-supplied or enabled information, data and communications made them space power users. Our own technological advances were being used against us. Equally, this provides vulnerabilities for us to exploit and it is entirely reasonable to see as much upside here as downside. If one pulled the key tenets of the last 10 years of air and space operations, including capability development and across allies and adversaries, the following key themes are apparent and can be argued to have genuine longevity. We will need to be active and anticipatory if we are to continue to regain and maintain advantage.

We will operate continually and fight episodically; success in the former, and especially in the grey zone of subthreshold and hybrid military activity will limit the latter. How we deploy our air assets as routine business will thus need to simultaneously reassure, deter, provide training and force development/experimentation opportunities and be integral to our messaging and our narratives. It is unlikely that their operations will be solely single domain-specific and they will almost certainly need to nest with multiple military, security, and other lines of operation.

In the recent past, we have at times struggled to maintain the right relationship between the diplomatic, information, military and economic (or DIME) lines of operation: successful military operations can be for naught if they are significantly out of alignment with, or outpacing, actions in these three other key areas. Increasingly, failure to understand and operate with agility within the information line might be the difference between success and failure.

We will also need to strike the right balance between demonstrating capability (as well as resolve) whilst keeping our most advanced capabilities and tactics secret and secure. This will only accelerate the move towards synthetics and the need for high fidelity synthetic environments within which we will train, test and experiment—routinely across multiple domains too. Our actual environments will be increasingly complex; Iraq and Syria is a foretaste of this. Global population growth and competition for resources will fuel much of this through the myriad malign consequences that will flow. We are likely to see urban operations as increasingly common (they were pivotal in both Libya and against Daesh) as population growth in cities continues across the world.

As a result, the nature of command in the air environment will almost certainly change too. Senior air commanders are too comfortable with the tactical and the technological; those who have gained recent operational command experience have been frustrated by the institutional inertia and memory that privileges joint command to those from other components, notably the land environment.

The US Air Force is investing heavily—conceptually, financially and in its people—in multi-domain operations. This, and key enabling elements such as the Combat Cloud, speaks to a step change in how air and space operations are planned, integrated and conducted in the future. This will need commanders with the experience and insights traditionally prized, married with the ability to exploit digitisation in its many forms and to visualise courses of action and possible outcomes in ways we have not been able to before. The opportunities of “digital twins” and routine, cross-government and multinational exercising will be a commonplace.

We will need to develop our people differently than at present—something the UK has recognised across its joint professional military education. We will move beyond both the autodidact and professionally curious, whilst the most talented will find his or her career a rich experiential and developmental pathway where air force posts are planned against those in the joint/integrated force and even interagency. Solely being the best tactical operator is not going to cut it, but operational experience and the realities of combat will still have both a premium and a value.

Most importantly, our way in air warfare will need to change, and our developing ways in space and cyber will need to be imaginative and unconventional. Arguably, we should recognise that the Third Offset Strategy already exists and is that developed and employed by our adversaries. We have continually developed and refined second offset technologies and their employment; in doing so, much our playbook has been studied by others and effective counters developed to limit or neuter our advantage. Some are asymmetric and beyond a counterforce solution: Russian and Chinese information operations are now commonplace—from elections to pandemics—and financial muscle affords influence across multinational fora.

All help create a favourable geostrategic context within which to exercise multiple levers of national power, including the military. The West “won” the Cold War through multiple means, including targeted spending on advanced capabilities that the USSR could not afford to match. We do not have that luxury now; indeed, one

could argue that both China and Russia are in a sweetspot of technological development, affordability, near/ actual peer capability and deployable mass. We will need to think and do differently.

## **Technologies and Tempo**

Encouragingly, the main strands of what could represent that new way in air warfare are in either conceptual or actual development. The technologies of the second offset strategy will continue to be developed, because used intelligently they continue to confer relative advantage. If attempting to negate them requires significant and active use of the EMS, then this helps develop our understanding and provides opportunity for both hard and soft counters; some of these means will be from other domains to allow required operations in air and space.

As such, the individual domain concepts that we develop will need a unifying purpose at their heart and will—by design—be interoperable and integrated to an extent not seen before. For coalitions and alliances, the trick will be to bring different nations up to the required level routinely, and able to be more sophisticated when required. Sharing information seamlessly, across multiple classifications and fusing myriad sources will be essential; harnessing the potential of artificial intelligence, machine learning and human machine teaming will make sense of the vast data lakes of information, sorting wheat from chaff and allowing human engagement ever further up the value chain.

This in turn will accelerate and multiply Boyd's OODA loop in a way that its inventor would have approved. Faster, more accurate understanding will allow swifter, better decision making and, allied to a raft of pan-domain effects and those exercised on the diplomatic, information and economic lines, generate multi-domain tempo that we see infrequently at present. Nor is this wishful thinking: all of these aspects were employed against Daesh in 2017 albeit occasionally, and doubtless elsewhere. More worryingly, they have also been employed at least in part against us too.

We will need to leverage the variety of talent and free (not “permitted”) thinking across our alliances and partners—a strength of democracies and a weak point for autocracies. And air forces will need to be more focused on the need to engage and shape public and political understanding and debate about emerging technologies. We are rightly bound by higher legal, moral and ethical standards than our opponents and must continue to be; but without engagement and education, we run the risk of investing multi-billions yet having technologies without permissions. One relevant area is autonomy and the extent to which human approval within a potentially lethal targeting chain is required or provided: Human On or In the Loop is thus not an arcane intellectual talking point, but a fundamental decision for national polities as they look to develop and employ future technologies within their forces.

A more profound question might be whether air and space become—for air, return to—genuinely strategic domains where our actions offer both strategic choice for us and dilemmas for our opponents. From Overy to O'Brien, historians have noted how, in the Second World War, Western air power underpinned and enabled a strategic war

fighting concept that avoided heavy attritional land campaigns—as suffered by the Soviets in the east as they finally overwhelmed an equally attrited Wehrmacht.

Thereafter, it was used as a continuous campaigning tool and method, whether in its own right or in concert with land and maritime power. In an early example of integrated activity to secure information advantage, we might think of the fusion of air and maritime power with ULTRA intercepts from Bletchley Park to win the Battle of the Atlantic. It is then more than a little disappointing that we have allowed our thinking on the air instrument and its strategic utility to atrophy over the last few decades, content to be a supporting junior component to the supposedly more important activity being done by others. We have lost the sense of air power as a political instrument too, just at the time where the strategic context—and the need when continually “operating” to be able to protect, engage and constrain—places a premium on this attribute.

## Final Reflections

It would be brave and a little foolish to unthinkingly re-energise the claims made by early air power theorists, but where ambition then outpaced technology, it might be true that it is now our ambition that is in lag. Our air and space operations of the last decade have been at the heart of a Western way in warfare, but an over-emphasis on technology and tactics has often stymied assessment of what strategic purposes air power can serve—in short, what it is for and what it allows.

The emphasis placed on COIN operations saw the dangers of “main effort” becoming sole effort realised, and we are still dealing with the unintended consequences when developing air and space power capabilities that are fitted for an era of persistent competition. However, we have inspiration and example to draw upon over many decades, and from its earliest days air power was seen as a strategic instrument. It continues to offer political choice: the drawn out, land-environment-dominated campaigns in Iraq and Afghanistan generated political risks, whilst both Libya and the campaign against Daesh have highlighted the agility and flexibility of air power, even if political outcomes have been or remain uncertain.

Air power has an inherent and innate capacity for integration too, across domains and with the widest array of agencies and organisations: the standard operating procedures that allow complex multinational air operations are the wellspring for this, and the time/speed/distance-crunching potential of both air and space platforms speak to agility and responsiveness. We might usefully reflect on whether we need to reconnect with what this affords at the operational and strategic levels, rather than over-concentrating on the technological and tactical as ends in themselves. Our opponents certainly have. Æ

### **Air Vice-Marshal Johnny Stringer, RAF**

Air Vice-Marshal Stringer most recently served as the Director of Strategy for UK Strategic Command.

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